Politics and Local Economic Growth: Evidence from India *

Paul Novosad†
novosad@fas.harvard.edu

and Sam Asher†

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Abstract

Does politics have an impact on local economic outcomes? Using a regression discontinuity design built around close elections in India from 1990-2005, we examine the local economic effects of one form of political favoritism: the benefit of having a local politician who is aligned with the party in control of the state government. We show that private sector employment in politically aligned constituencies grows by 1.7 percentage points more per year than in non-aligned constituencies. We find no effect on government employment or supply of public infrastructure. Stock prices show 12-15% positive cumulative abnormal returns when an aligned candidate wins the constituency where a firm is headquartered, suggesting that political alignment is a net benefit to both local labor and capital. Finally, we use international survey data to classify industries by their dependence on (i) government bureaucracy, (ii) direct transfers in the form of procurement, and (iii) external finance. We find the effect of political alignment is largest in industries that depend most on government officials, with no significant effect of dependence on credit or procurement. The results suggest that state politicians can control the enforcement of regulation, with important economic consequences.

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†Harvard University

1 Introduction

Does politics affect local economic outcomes? Political considerations affect the spatial distribution of government transfers (Albouy, 2009; Ansolabehere and Snyder, 2006) and public spending (Finan, 2004; Besley et al., 2004). Favored firms are more likely to receive credit from state banks (Cole, 2009; Khwaja and Mian, 2005; Carvalho, 2010) and corporate bailouts (Faccio et al., 2006), and their valuations are tied to the fortunes of powerful politicians (Fisman, 2001).[1]

Whether these targeted effects add up to a substantive impact on local economies is not as well understood. Politically motivated government inputs could be important for local growth, or they could displace productive activity.[2] Alternately, they could have no local impact at all.[3]

We construct a state-constituency-level census of firms in India to measure the effect of one form of political favoritism on the local economy.[4] We examine the effect of having a political representative who is affiliated with the party in control of government.[5] State-level legislative constituencies provide a large number of elections with staggered years, within a common institutional framework. The empirical challenge is that locations that favor the dominant party may differ in many characteristics from locations that vote for opposition parties.[6] We use a regression discontinuity design to control for these differences. By com-

[1]Some additional examples include Aghion et al. (2009), Khemani (2007), Hoover and Pecorino (2005), Dixit and Londregan (1996) and Arulampalam et al. (2009).

[2]Studies of the effect of local government spending on private sector activity find both positive and negative estimates (Cohen et al., 2011; Ramey, 2011; Shoag, 2011). While politicians may be able to create local jobs (Carvalho, 2010), they may also disproportionately tax and embezzle funds from their supporters (Sukhtankar, 2012; Kasara, 2007).

[3]This is suggested by both Khwaja and Mian (2005) and Cole (2009), who find that politically motivated loans largely result in default.

[4]Economic data is rarely reported at the level of political constituencies. Data collection tends to aim for representativeness at a higher level of aggregation, and the boundaries of legislative districts change frequently. Most economic data from India (NSS, ASI) are reported at the district level; districts on average contain 10 legislative constituencies.

[5]An analog in the U.S. is whether Republican congressional districts have better economic outcomes when Republicans are in control of Congress.

[6]For example, a caste-based party is likely to win support from areas dominated by lower castes. These

paring locations where aligned candidates narrowly won to those where aligned candidates narrowly lost, we focus our empirical test on places that are likely to be comparable on unobservables.

This paper makes four contributions. First, we show that political alignment has large effects on total employment. Second, we find no measurable effects on construction of public infrastructure or creation of government jobs. Third, we show that this employment is a net benefit to firms, as reflected by share prices. Finally, we find evidence that regulation is an important mechanism for these effects.

We find that private sector employment growth is 1.7 percentage points per year higher, over a seven year period, in locations with government-aligned politicians, relative to locations with non-aligned politicians.[7] We find no effect on employment in the public sector or state owned firms, nor do we find an effect on the construction of public infrastructure.

Employment growth is not a sufficient statistic for firm welfare; politicians could be forcing firms to make inefficient hiring decisions (Shleifer and Vishny, 1994). We examine stock returns around elections, to test whether firms receive higher valuations when their home constituencies become aligned. We find that stocks experience cumulative abnormal returns in the range of 12-15% in the month following state elections, when the local government-aligned candidate is victorious, suggesting that politician alignment is indeed good for local firms.

How do politicians affect the local economy? We consider three classes of mechanisms: (i) regulation; (ii) direct transfers; and (iii) supply of factors of production. We classify industries using international survey data, and test these mechanisms by exploring which industry classes are most affected by the alignment of local politicians. The effect of political alignment is largest in industries that depend most on bureaucratic inputs, indicated by use

areas will have a history of marginalization, and be on different growth paths.

[7] Alignment is a characteristic of the political representative of a location, rather than the location itself. Nevertheless for ease of exposition, we will also use the terms "aligned location" and "non-aligned location."

of licenses and permits, and frequent meetings with government officials. We do not find strong evidence supporting other channels. We find suggestive evidence that outcomes are particularly bad for constituencies narrowly lost by the governing party, suggesting that regulatory enforcement may be a more efficient tool at inhibiting economic activity than at promoting it.

Our results are consistent with a model of politicians who choose between policy levers to maximize future electoral outcomes, with consideration for the costs and returns of using those policy levers. The burdensome regulatory environment in India and political control of bureaucrats (Iyer and Mani, 2012; Pritchett, 2009) make it very cheap for politicians to control the enforcement of regulation at a local level. The ease of targeting and low cost of regulatory enforcement appear to make it a desirable strategic tool for Indian politicians.[8]

Section 2 provides the institutional context for our work, and a conceptual framework for thinking about the importance of political alignment. Section 3 describes the sources and construction of our data, and Section 4 explains the empirical strategy. Section 5 presents results, and section 6 discusses possible interpretations. Section 7 concludes.

2 Background and conceptual framework

This section describes the electoral system in India and the mechanisms by which politicians can affect firms. A conceptual framework below specifies how we think about political decision-making, and why we would expect political alignment to be important.

[8]Other work shows that institutions can restrict the choice sets of politicians (Grembi et al., 2012; Ferraz and Monteiro, 2010; Wyplosz, 2012). In the Indian context, the absence of an effective institution of bureaucratic independence expands politicians' choice sets.

2.1 State politics and firms in India

This paper focuses on state-level elections and local growth in Indian legislative constituencies, which are the political subdivisions of states. State governments are central actors in the allocation of government inputs.

The Indian constitution grants significant administrative and legislative power to state governments. States incur 57% of total expenditures, and have administrative control over police, provision of public goods, labor markets, land rights, money lending, state public services, and retail taxes. States operate their own civil services, and in practice state politicians exert a significant degree of control over federally-appointed bureaucrats assigned to their state (Iyer and Mani, 2012). 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).

State elections are characterized by a first-past-the-post system. Candidates compete in elections to represent single-member legislative constituencies; the candidate with a plurality wins the seat. The party with the largest number of seats in an election has the first opportunity to form a government; it may do so alone or as part of a coalition. If the party fails to form a majority, the party with the next highest number of seats may try to form a majority coalition. The characteristic of this system that we exploit is that the representative (Member of the Legislative Assembly, or MLA) of a given location may or may not be a member of the party in control of government. Indian elections between 1990 and 2005 were competitive. In addition to the two major national parties (Indian National Congress and Bharatiya Janata Party), several regional and caste-based parties experienced electoral success in state elections.

Firms in India have a high dependence on government and government-supplied inputs. Low quality or lack of public infrastructure is a major constraint on firms: in 2005, 36% of Indian firms reported that electricity supply was a major or severe obstacle to firm growth.

In 1990, nearly all banks were operated by the state, making the government a monopolist supplier of formal credit.[9]

India's burdensome system of industrial regulation, known as the License Raj, required firms to get state approval before making any major production decisions, including expansion, entry, hiring and firing of workers and importing goods. While the 1990s were a period of significant liberalization, the regulatory burden on firms remained high by international standards through the study period (Panagariya, 2008). Finally, state-owned firms remain an important part of the economy.[10]

The evidence that Indian politicians use the policy levers at their disposal for personal and electoral gain is ample. Income support programs are captured by politicians (Besley et al., 2011; Jha et al., 2009). Cole (2009) finds large electoral cycles in the provision of agricultural credit. Khemani (2007) finds that fiscal transfers to states serve the electoral interests of the ruling party. Histories of the large business houses in India document the close relationship between important businessmen and politicians (Singh, 2011; McDonald, 2010).

2.2 Conceptual Framework

We think of the majority or governing party as making choices over the allocation of government inputs, with electoral goals in mind.[11] If a local candidate's electoral success is affected by the quality of government inputs in his constituency, the party has an incentive to favor locations held by its own politicians, and to disfavor locations held by party opponents. As is supported by the literature cited above, we therefore expect aligned constituencies to receive more government inputs than non-aligned constituencies. Assuming some convex cost

[9] By 2005 some privatization of banks had taken place but 54% of banking sector employment remained in state-owned banks.

[10] In 1990, the public sector and state-owned firms accounted for 18.8% of non-farm employment; by 2005 this number was 13.8%

[11] We focus on a two-party example here. Appendix B describes how we extend our empirical strategy to take into account many parties and dynamic coalitions.

function of deviating from equal provision across all locations, we would expect this electoral strategy to be concentrated in swing constituencies. Locations narrowly won by the party should receive the most resources, and locations narrowly lost should receive the fewest. We generate these predictions from a simple model with rational voters, described in Appendix A.

Politically motivated government inputs do not necessarily lead to growth. A party will choose the policy levers that maximize electoral returns, which may or may not be those best for growth. Our empirical strategy tests whether economic outcomes are different between aligned and non-aligned constituencies. If we find an effect, we infer that (i) politicians have allocated government inputs differently across aligned and non-aligned locations; and (ii) those government inputs have an effect on economic outcomes.

We think of each policy lever as having a cost to the party, an electoral return, an economic effect, and a level of spatial targetability.[12] Political alignment should have the largest impact on policy levers that (i) are targetable at the constituency-level; (ii) are low cost; and (iii) have a high electoral return.[13] The tools empirically chosen by politicians are then informative of which policies have these characteristics.

Two papers find results closely related to this paper. Brollo and Nannicini (2012) find that municipalities with state-aligned incumbents receive greater transfers in election years than municipalities with non-aligned incumbents. 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

[12]For example, a general transfer program like a pension would be difficult to target to a single constituency. Procurement contracts can be targeted directly to firms, and thus are highly targetable. Road and electricity projects tend to affect multiple constituencies; they are targetable to the extent that geographically proximate constituencies have similar characteristics. In the case of swing constituencies, this is not likely to be true.

[13]The economic return is relevant to the extent that the party is concerned about welfare. We generally expect economic and electoral returns to be correlated, as voteres reward economic performance. However, highly salient government actions may have higher electoral returns than economic returns.

the federal coalition. We exploit a similar electoral logic, but focus on measuring the local economic impact of these political behaviors.

3 Data

This section describes how we constructed the economic census of firms, as well as the other data sources used in this paper.

The standard economic data sets used in India report data at the level of districts, which are approximately ten times larger than legislative constituencies. We matched the village and town-level Economic Census and Population Census of India to legislative constituencies, creating to our knowledge the first dataset linking economic and population outcomes to legislative elections.

The Indian Ministry of Statistics and Programme Implementation (MoSPI) conducted the 3rd, 4th and 5th Economic Censuses respectively in 1990, 1998 and 2005.[14] The Economic Census is a complete enumeration of all establishments except those engaged in crop production and plantation; there is no minimum firm size, and both formal and informal establishments are included.

The Census codes information on the location of the establishment (village for rural areas and ward-block for towns), the type of ownership, number of employees and some of their characteristics, source of electricity and finance, and the social group of the owner. The main product of the firm is also coded using the 4-digit National Industrial Classification (NIC). More detailed information on income or capital is not included. The main strengths of the data are its comprehensiveness, and rich detail on spatial location and industrial classification of firms.

We obtained location directories for the Economic Censuses, and then used a series of

[14] The 1st and 2nd were conducted in 1977 and 1980, while the 6th was planned to begin in 2012.

fuzzy matching algorithms to match villages and towns by name to the population censuses of 1991 and 2001.[15] We were able to match on average 2923 (62%) of towns and 515,114 (93%) of villages.

The NIC industrial classification system was updated in 2004; we created a manual correspondence between the NIC codes used in the different rounds of the Economic Census, which entailed grouping together categories which were not kept distinct in all the NIC classifications. We are left with 217 industry codes.

We use data from the Population Census of India in 1991 and 2001, which includes village and town demographic data, as well as information on local public goods (roads, electricity, schools and hospitals).

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 were then aggregated to constituencies. We measure employment growth as change in constituency-level employment from 1990-98 and 1998-2005.

Election data for the period 1980-2007 were downloaded and cleaned from the web site of the Election Commission of India. We created a time series of political parties by manually matching party names, taking into account party fragmentation and consolidation. We constructed state coalition alliances, and poll and election dates from newspaper articles. The top panel of Figure 7 displays a map of the locations where we were able to match electoral data to economic data, and shows the split of aligned and non-aligned locations. The bottom panel identifies which of these locations had elections decided by margins within the optimal bandwidth used below.

As states follow distinct electoral calendars, we define electoral variables based on the first election in a state after the baseline measurement period.[16] We ignore additional elections in

[15] The Economic Censuses of 1990 and 1998 were conducted with the house listing for the 1991 population census, while the 2005 Economic Census used codes from the 2001 population census.

[16] Example: For the Economic Census period 1990-98, we use elections from 1991 (Kerala, Tamil Nadu,

the census period, and test robustness over different inclusion rules. Figure 2 illustrates this process. Incumbency conveys a zero or negative effect in Indian state politics (Uppal, 2009), 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.

For stock prices and market indices, we use Datastream's monthly return index for individual equities listed on either the National Stock Exchange or the Bombay Stock Exchanges. We matched companies to legislative constituencies using the headquarter pincodes listed in Datastream, and pincode latitude and longitude from the GeoNames pincodes database. We limit the sample to companies located outside of India's major cities, as companies located in major cities are less likely to have a significant share of their operations in the constituency where their headquarters are located. We identified 166 firm-election pairs in 52 constituencies that experienced close elections between 1990 and 2007.[17]

We construct industry-level measures of dependence on procurement, credit and bureaucratic inputs, using international data from the World Bank's Enterprise Surveys. These are based on firm-level surveys undertaken in 115 countries, including India, covering a range of topics about the business environment. We retain data on firms' revenue share from government, source of finance and quantity of external finance, and bureaucratic dependence, such as use of operating licenses and permits, and meetings with government officials, and paying of bribes. We construct measures both from the Indian survey and from the 2011 Standard-

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).

[17]Before 1990, Indian stocks are very thinly traded. Our results are robust to alternate sample start dates. 2007 is the terminal year, as electoral redistricting took place and we did not have access to nationwide geographic data on the new constituencies.

ized International Survey (which does not include India) to avoid any reverse causality from government policy to firm characteristics in India.

Our objective is to create an an industry-level indicator variable for each of these measures, that is equal to one if an industry has above the median value of all firms in that industry. In order to ensure that we are capturing cross-industry variation rather than cross-country variation, we first rank industries as high or low within a given country, and then take means of those measures across countries. We finally dichotomize these means to classify industries as high or low on each measure.

Table 1 shows constituency means of all variables at baseline, displayed separately for locations that end up with aligned and non-aligned politicians. The t statistic for the difference of means is displayed, as well as the t statistic from estimating Equation 1 with the baseline value as the dependent variable.

4 Empirical strategy

We would like to test whether locations with government-aligned politicians experience different economic outcomes from locations with non-aligned politicians.

4.1 Local Economic Outcomes

We could run the following regression of constituency alignment on an economic outcome:

$$Y_{cst} = \beta_0 + \beta_1 * aligned_{cst} + \eta_s + \gamma_t + \epsilon_{cst}$$

Y_{cst} is an economic outcome in constituency c in state s at time t. $aligned_{cst}$ is an indicator for whether the politician representing constituency c is aligned with the governing party at the state level, and η_s and γ_t are state and year fixed effects. The term ϵ_{cst} refers

to unobserved characteristics of the constituency or politician at time t.

The problem with this approach is that constituencies that elect politicians from the governing party may differ in unobserved ways from constituencies that elect opposition party politicians. At a minimum, the citizens of these constituencies have greater preferences for the dominant party, which could be correlated with many important economic factors.

To account for unobserved differences in politicians or constituencies, we focus on very close elections between aligned and non-aligned politicians. If these elections are close enough to swing for either candidate, they provide nearly random variation in the identity of the winning candidate (Lee, 2008; Lee and Lemieux, 2010). The underlying assumption of our regression discontinuity is that a constituency barely won by the aligned candidate is comparable to a constituency barely lost by the aligned candidate on any unobserved characteristics that could be correlated with the dependent variable. We run a standard set of tests of this assumption.

India is characterized by a large number of parties and candidates contesting elections. For simplicity, we first present our empirical design in a two-party context; further below we bring in the possibility of additional candidates and dynamic coalitions.

Consider a state with K constituencies, and candidates from two parties B and C contesting each electoral seat. The party which obtains a plurality of seats becomes the governing party.

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

$$margin_{cst} = \frac{v^a_{cst} - v^n_{cst}}{v^{tot}_{cst}}.$$

Without loss of generality, let B be the governing party, so that candidates from party

B are defined as aligned, and the definition of margin is:

$$margin_{cst} = \frac{v^B_{cst} - v^C_{cst}}{v^{tot}_{cst}}.$$

By construction, $margin_{cst}$ is positive if the candidate from party B has won the election in constituency c, and negative if B has lost. We can thus define the forcing variable $aligned_{cst}$ as an indicator equal to one if $margin_{cst}$ is greater than zero.

Since $margin_{cst}$ may covary with the outcome variable, we want to limit the test to locations with almost identical values of $margin_{cst}$. In the limit, these are constituencies where the election is decided fully at random. The population estimator β is defined by:

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

We use two standard specifications to generate sample estimates of this parameter, following Imbens and Lemieux (2008). Both tests estimate, separately for aligned and non-aligned constituencies, a regression of the outcome variable on $margin$. The predicted outcome is then compared across aligned and non-aligned constituencies.

The first test uses a local linear regression, with a bandwidth optimally calculated according to Imbens and Kalyanaraman (2009). We allow for the relationship between $margin$ and the outcome variable to differ across aligned and non-aligned constituencies. The specification is described by Equation 1:

$$Y_{cst} = \beta_0 + \beta_1 align_{cst} + \beta_2 margin_{cst} + \beta_3 margin_{cst} * aligned_{cst} + \boldsymbol{\zeta} \mathbf{X}_{cst} + \boldsymbol{\gamma}_t + \boldsymbol{\eta}_s + \epsilon_{cst}, \quad (1)$$

where Y_{cst} is a constituency-level economic outcome, $\mathbf{X}_{cst}$ is a vector of time-variant constituency controls, and $\boldsymbol{\eta}_s$ and γ_t are state and year fixed effects. ϵ_{cst} is clustered by state.

Constituency controls and fixed effects are not necessary for identification but improve the efficiency of the estimation. The effect of alignment with the governing party is identified by β_1.

The second test regresses the outcome variable on a polynomial function of the running variable *margin* across the entire sample of elections, and estimates a discontinuity at the point where *margin* becomes positive. The estimating equation is:

$$Y_{cst} = \beta_0 + \beta_1 * aligned_{cst} + f(margin_{cst}) + g(margin_{cst}) * aligned_{cst} + \boldsymbol{\zeta} \mathbf{X}_{cst} + \boldsymbol{\gamma}_t + \boldsymbol{\eta}_s + \epsilon_{cst}, \quad (2)$$

where $f(\cdot)$ and $g(\cdot)$ are polynomial functions, and other variables are defined as in equation 1. The interaction between the polynomial function and $aligned_{cst}$ allows for a separate functional form for the running variable in aligned and non-aligned constituencies. β_1 estimates the effect of political alignment at the point where $margin_{cst} = 0$. ϵ_{cst} is clustered at the state level. Constituency-level controls included are log of total employment, log of population, urbanization rate and geographic size of constituency, with time variant controls measured in the baseline period.

State elections in India are contested by a large number of candidates and parties, and in more than half of cases the leading party needed to form a coalition in order to gain a majority. Appendix B explains how we extend the empirical strategy above to account for more than two parties and dynamic coalition formation.

In brief, we assign parties to coalitions based on information known before the election takes place. We use newspaper articles or other documentation describing pre-election coalitions, or we predict coalitions based on alliance following the previous election if we could not find a description of pre-election alignment. This approach ensures that our result is not biased by the possibility that some unobserved factor (e.g. party competence) drives both entry into the coalition and the economic outcome. From this point forward, we use the

term candidate alignment to mean predicted alignment rather than ex-post alignment.

We exclude constituencies where the top candidate ran as an independent, as we cannot observe whether independent candidates vote with or against the ruling coalition.[18]

4.2 Stock prices

Local employment growth alone does not imply that firms are better off: if firms' hiring decisions are a response to political pressure, employment growth could lower firm value. To directly test the effect of political alignment on firm value, we examine whether local politician alignment affects stock prices. In an efficient market, the prices of publicly traded firms reflect the information of all market participants. Firm prices can thus capture characteristics of firms that are unobservable to researchers, such as the value of political connections.[19]

If an election between an aligned and non-aligned candidate is expected to be close, the pre-election share price of a local firm will be a weighted mean of the value of the firm under an aligned politician, and the value of the firm under a non-aligned politician. After the election, the uncertainty is resolved and the share price reflects the value of the firm under the winning politician (Malatesta and Thompson, 1985). By comparing stock returns of firms in locations where the aligned candidate won with those where the aligned candidate lost, we estimate the value placed by the market on political alignment.[20]

If aligned politicians are forcing firms to hire workers when it is against the firms' interest, we should see stock prices fall when the local representative becomes aligned. However, if

[18] 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.

[19] This use of stock prices was first demonstrated by Roberts (1990) and has been used by Fisman (2001) and Jayachandran (2006). While the latter papers are based on direct relationships between politicians and individual firms (based respectively on family and political contributions), we focus on the inherent relationship between a firm's place of business and the local politician there.

[20] A single firm's price response to the election of an aligned candidate would capture a combination of the economic effect of alignment with the estimated ex ante probability of the aligned candidate winning. By comparing price movements of firms in locations that become aligned with those that become non-aligned, we will capture the full economic effect, as long as we have a sufficient number of firms in locations with close elections.

politicians are bringing useful government inputs to a location, we expect local stock prices to rise. We use a repeated "event study" methodology, using monthly stock returns from India's two major stock exchanges, the Bombay Stock Exchange and the National Stock Exchange. We use monthly data because of the long lag between voting and official announcement of election results. Information is revealed throughout this period, so it is not possible to identify a single date when the information is processed by the market.[21]

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

$$R_{it} = \alpha_i + \beta_i R_{mt} + \nu_{it},$$

where R_{mt} is a value weighted market return index and ν_{it} is an orthogonal error term.

We estimate Equation 3 to determine whether politician alignment generates abnormal returns for local firms in the month following a close election:[22]

$$CAR_{i,t-1\to t+1} = \beta_0 + \beta_1 align_{i,t} + \beta_2 margin_{i,t} + \beta_3 margin_{i,t} * aligned_{i,t} + \boldsymbol{\zeta}\mathbf{X}_{i,t} + \boldsymbol{\eta}\mathbf{Y}_t + \boldsymbol{\gamma}\mathbf{S}_i + \epsilon_{i,t}, \tag{3}$$

where $CAR_{i,t-1\to t+1}$ is the cumulative abnormal return of a stock from the month before to the month following an election, and other variables are defined as in Equation 1. We limit the sample to close elections as above, cluster standard errors at the constituency level, and weight with a triangular kernel.

The inclusion of the *margin* variable in Equation 3 takes into account the fact that closer elections reveal more information to the market. If a winner was widely expected, we would expect an election to have no effect on asset prices. Estimating Equation 3 without the

[21] Voting often takes places on multiple days, and results may not be 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.

[22] Closeness of election in this case provides identification of the RD, and also implies that the local election result will be information that the market did not know before the election.

margin variable therefore puts a downward bias on β_1.[23]

4.3 Identifying the mechanisms

Our final objective is to identify what types of firms are most affected by political alignment. Our basic approach is to estimate Equation 1, with location or industry characteristics interacted with the electoral results. The factors that strengthen the effect of political alignment are informative about the constraints on firm growth, as well as on the policy tools being used by politicians. As most of the interaction measures we use are ordinal, we divide our firm or location sample into two groups, and code the ordinal characteristic with a dummy variable.[24]

Using procurement as an example, the estimating equation is:

$$\begin{aligned} Y_{csti} = \beta_0 + \beta_1 align_{cst} + \beta_2 margin_{cst} + \beta_3 margin_{cst} * aligned_{cst} + \beta_4 PROC_i + \\ \beta_5 align_{cst} * PROC_i + \beta_6 margin_{cst} * PROC_i + \beta_7 margin_{cst} * aligned_{cst} * PROC_i + \\ \boldsymbol{\zeta} \mathbf{X}_{csti} + \boldsymbol{\gamma}_t + \boldsymbol{\eta}_s + \epsilon_{csti}, \end{aligned} \tag{4}$$

where $PROC$ is an indicator for whether a firm is in an industry with above average dependence on government procurement contracts, and i indexes the high and low procurement groups of firms. The other interactions used are proxies for dependence on bureaucratic

[23] Note that the win margin is an imperfect measure of the uncertainty over the result in advance of an election. For example, if an election turns out to be closer than expected, we are overestimating the ex ante closeness. However, we know of no data on advance polls or expectations of races for individual legislative constituencies, hence our use of win margin as a proxy for ex ante closeness.

[24] An alternate approach would be to create a constituency-industry panel using the 217 product classification codes provided in the Economic Census. While this methodology is also sound, it produces extremely noisy estimates due to (i) the large number of zeroes in the full constituency-industry panel, since most constituencies do not produce most products; (ii) the large variation in the size of industries within a given constituency; and (iii) narrow misclassification of certain industries from one census period to the next. For example, coding appears to be inconsistent across the categories of "Manufacture of made-up textile articles (except apparel)" and "Manufacture of blankets, shawls, carpets, rugs and other similar goods." The result is that some locations show large growth in one industry and large decline in the other, when it is more likely only the classification has changed. However, both of these are classified as industries with low dependence on procurement, so much of this noise is eliminated when we aggregate to constituency-industry groups.

inputs and dependence on external finance.

Note that the industry or location attribute that we interact with the dependent variable is not randomly assigned. Therefore it is possible that any interaction effect that we pick up is in fact driven by some other unobserved source of variation that is correlated with the interaction variable.

4.4 Balance Tests

The regression discontinuity approach relies on constituencies barely won by majority aligned candidates being alike on unobservables to constituencies barely lost by aligned candidates. This notion is challenged by recent work by Grimmer et al. (2012), who find that candidates who enjoy structural advantages in U.S. elections disproportionately win elections that are very close.[25] In light of this evidence, we take extra care to perform a large number of tests to demonstrate that these types of advantages do not drive the outcomes of close elections in India.

A key assumption for identification in the regression discontinuity model is that the forcing variable is continuous near the treatment threshold (Lee, 2008). Figure 3 describes the density of the forcing variable, $margin$. Constituencies with $margin > 0$ are those that were narrowly won by governing party-aligned MLAs, while those with $margin < 0$ were narrowly lost by 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 to the right of zero because on average the ruling coalition wins more often than it loses.

[25] Examples of structural advantages include alignment with the state majority party, the state Governor, or the Secretary of State's office.

Panel C shows the fit of a McCrary test of continuity in the density of the running variable at zero, for our full sample of elections (McCrary, 2008). Panel D restricts the test to the sample of elections matched to the population and economic census and used in subsequent analysis. The tests do not reject continuity in the running variable at the alignment threshold.

Figures 4 and 5 perform tests analogous to those performed by Grimmer et al. (2012). We analyze the tendency of close elections to be won or lost by candidates with two types of structural advantage: local incumbency, or membership in the state majority party, that is, the party in control of government institutions when the election takes place. Figure 4 shows the McCrary tests of the win/loss margins of these two types of candidates; the tests do not reject continuity at the winning threshold. Figure 5 shows that the winners of very close elections are not more likely to have structural advantages than the losers. In fact, the left panel suggests that the winners of close elections are slightly less likely to be local incumbents.

If a close election provides variation in the winning candidate that is as good as random assignment, then constituencies narrowly lost by aligned candidates should be indistinguishable on observables from constituencies narrowly won by aligned candidates. Columns 4 and 5 of Table 1 shows the point estimate and t statistics from estimating equation 1 on baseline constituency characteristics. The coefficient on the forcing variable *aligned* is significant at the 10% level in only one of these cases (rural electrification), indicating that aligned and non-aligned constituencies are alike on observables.

Finally, Figure 6 is a visual representation of the balance test on baseline log employment. It shows the mean value of log baseline employment across constitutencies won and lost by aligned candidates by the entire range of vote margins. Constituencies won by aligned candidates appear to the right of zero. Consistent with Table 1, there is no noticeable difference in baseline employment between constituencies narrowly won and narrowly lost

by aligned candidates.[26]

5 Results

This section provides evidence that political alignment has a significant positive effect on local private sector employment growth, and stock prices of firms. These findings are robust to a range of regression discontinuity specifications. This effect is largest in firms with a high dependence on bureaucratic inputs.

5.1 Economic outcomes

Table 2 presents the regression discontinuity estimates of the effect of political alignment on constituency-level log employment growth. Column 1 presents local linear regression estimates from Equation 1 with year and state fixed effects. The estimate on *aligned* indicates that where elections were closest, constituencies with aligned MLAs grew 1.6 log points more per year than non-aligned constituencies, over a seven year period. The measured effect over the 7- or 8-year census period is 12 percentage points.

Controls are not necessary for identification, but their inclusion increases the efficiency of the estimator. Column 2 adds lagged constituency controls. The annualized estimate falls to 1.5 log points, with a smaller standard error. To generate a measure indicative of total employment in the sample, column 3 weights observations by lagged employment. The estimate and standard error are unchanged, suggesting that the effect of political alignment is unaffected by constituency size.

[26]It may be surprising to find that the structural advantages enjoyed by U.S. electoral candidates are less important for close elections in India, a considerably less developed country. It is worth noting that India's federal electoral commission is perceived to have been an island of bureaucratic excellence since independence, explaining the country's largely non-violent history of elections. Indian incumbents are also considerably less entrenched than American members of congress, as both state parties and politicians turn over very frequently in the period studied. Finally, the relative lack of polling in many state elections implies that politicians may not know which electoral races will be close, making it more difficult for richer parties to effectively direct funds to the closest races.

Columns 4 through 6 present analogous estimates of the full sample polynomial specification (Equation 2) on the same outcome. The polynomial specification reports smaller estimates close to 1.0 percentage points per year, with similar statistical significance to the local linear specification.[27]

Figure 7 plots estimates from Equation 1 with a range of bandwidths, an alternate kernel and a different window of election years. The local linear results are very stable. The full polynomial estimates in Panel D are affected by the inclusion or exclusion of observations with elections that were not close at all. The point estimate ranges from 0.011 with the inclusion of win margins smaller than 60%, and rises monotonically to 0.021 as the sample is restricted to smaller win margins. The premise of the regression discontinuity approach is that the identified treatment effect is only valid for very close elections; this sensitivity to inclusion of observations with very large win margins makes the polynomial specification less desirable, motivating us to focus on the local linear method for the analysis below. Reassuringly, the polynomial estimates are positive and highly significant for all samples used, and the local linear estimates fall at the midpoint of the range of polynomial estimates.

Figure 8 presents a visual representation of the regression discontinuity estimates. The win margin for the aligned candidate is plotted on the x-axis, with log employment growth on the y-axis. The sample is divided into bins based on the win margin of the aligned candidate, and the points represent mean log employment growth in those bins. Locations just to the right of the solid vertical line were narrowly won by aligned candidates, while locations just to the left of the solid line were narrowly lost. The regression lines show the value and 95% confidence interval of a 4th degree polynomial function fitted to the raw data, with separate specifications for aligned and non-aligned candidates. The jump in the regression line at

[27] Appendix Table 10 runs standard placebo tests of these regressions, with simulated discontinuities at the 1st and 3rd quartile of the distribution of the win margin. As expected, these estimates are insignificant and close to zero. Appendix Table 11 uses local linear regression with polynomial controls for the win margin on both sides of the threshold. Estimates are very similar, albeit more noisy when a local 3rd degree polynomial is used.

zero is a visual analog of the estimates in Table 2.

We draw attention to three characteristics of this graph. First, the effect of alignment is large and significant when elections are close. Second, the effect of alignment appears to be highly local; constituencies won by a large margin do not grow employment at a different rate from those lost by a large margin. This finding is consistent with our conceptual framework: the returns to investing in economic outcomes have the highest electoral returns when elections are close.

Third, political alignment appears to have an effect primarily in constituencies lost by the aligned candidate. We emphasize that the regression discontinuity design does not identify this characteristic of the effect without further assumptions. There could be important unobserved variation between constituencies with close elections and those with wide victory margins.[28] Our empirical design allows us at best to make a causal claim only about the difference between aligned and non-aligned constiutencies. That said, the visual effect is striking, and we will discuss it in Section 6.

We now consider two outcomes over whose allocation we would expect politicians to have some influence: public sector employment and public goods.

Table 3 presents estimates of Equation 1, with employment disaggregated across private and public sectors. As above, estimates are reported (i) without controls; (ii) with lagged constituency controls, and (iii) with controls, and weighted with lagged baseline employment. The first three columns report estimates of the effect of political alignment on log public sector employment, which includes public sector establishments and state owned firms. The next three columns report the effect on log private sector employment. The coefficient of interest is almost twice as large for private firms as it is for government establishments,

[28] One possibility is that close elections makes firms reluctant to invest because of uncertainty over the power of their political connections. If growth is lower when elections are close even in the absence of political intervention, then it is more difficult to determine whether the alignment effect is coming from aligned or non-aligned constituencies.

but the difference between the two is not statistically different from zero, based on a joint significance test. The effect of political alignment on employment in government firms is also indistinguishable from zero.[29] While we cannot say definitively that the effect of political alignment is driven by private sector firms, it is clear that politician influence over hiring at public sector firms is not what is driving the effect on total employment.

Tables 4 and 5 examine the effect of political alignment on local public infrastructure. Equation 1 is the basis for all columns of these tables, with different measures of constituency-level changes in public goods as the dependent variables.

Table 4 shows the RD estimates of politician alignment on construction of urban public infrastructure between 1991 and 2001. The dependent variables are aggregated from town data to the constituency level, and normalized by the mean and standard deviation in 1991. The columns respectively show the effect of alignment on: (1) km of paved urban roads; (2) number of urban electrical connections; (3) number of primary schools; (4) number of secondary schools; and (5) number of hospitals. None of the estimates are significantly different from zero. The standard errors indicate that, with 95% confidence, we can rule out positive effects in the range of 0.2-0.4 standard deviations from mean.

Table 5 shows the analogous table for rural public infrastructure. The columns are constituency aggregates of village data representing the: (1) share of villages with a paved access road; (2) share of villages with an electricity connection; (3) share of villages with a primary school; and (4) share of village land that is irrigated. As with the town data, none of the estimates are significant. We can rule out effect sizes of 0.4 standard deviations for primary schools, and 0.2 standard deviations for the other measures.

In summary, we do not find a statistically significant effect of political alignment on either public sector hiring or construction of public infrastructure. The latter result is consistent

[29]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.

with other work on India, which finds 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). The large negative coefficients on the baseline values in Table 5 suggest that this was a period where the least well-off villages experienced substantial growth in public infrastructure. We discuss in Section 6 discusses some other reasons that strategic allocation of public goods may not play a major role in closely contested constituencies.

5.2 Stock prices

Growth in private sector employment does not necessarily indicate that firms are better off. A firm could be worse off with increased employment if a politician is forcing the firm to hiring workers beyond the point of efficiency. To test whether market participants place a higher value on publicly traded firms when they are located in aligned constituencies, we examine the returns of firms after close elections between aligned and non-aligned candidates.

Table 6 report estimates from Equation 3, which identifies the effect of political alignment on the share prices of local firms. 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. The election of an aligned politician is associated with a positive abnormal return in the range of 12-15% in the month following the election. Figure 9 shows mean cumulative abnormal returns, sorted by the win or loss margin of the locally aligned candidate. Returns are visibly higher immediately on the positive side of the threshold, and are high (but noisy) for candidates winning by larger margins as well.[30]

Columns 5 and 6 are placebo tests, using the cumulative abnormal return in the month

[30] An alternate estimating approach would be to estimate the cumulative abnormal returns of firms, without focusing on the discontinuity. Even if a local election is not close, the uncertainty over which party becomes the majority party is resolved after an election. Appendix Table 12 shows estimates from this test. Firms experience positive but smaller cumulative abnormal returns, consistent with the fact that less uncertainty is being resolved when elections are not close.

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 statistically significant.

If politicians are forcing firms to hire excess labor for political reasons, as in Shleifer and Vishny (1994), we would expect political alignment to result in no effect or a negative effect on share price, as firms' labor decisions become sub-optimal. The positive effect rejects this explanation of the effect of political alignment on employment growth. In addition, it suggests market participants are informed about the importance of political alignment to firms, and price this information into stocks.

These results also corroborate our interpretation of the timing of results from Section 5.1. Our results on employment are based on total employment changes over a seven year period, during which other factors may have changed in unobservable ways. The stock price study is very precise on timing, showing that valuations of firms change in the precise month that an election takes place.[31]

5.3 Mechanisms

We next explore potential mechanisms that politicians could be using to affect local employment growth. We investigate three classes of mechanisms: (i) regulation; (ii) direct transfers; and (iii) supply of factors of production.

Table 7 estimates the standard specification, with an interaction variable specifying whether a firm is in an industry with a high dependence on bureaucratic officials. The respective measures used are industry-level measures generated from the following firm-level

[31]Note that publicly traded firms are considerably larger than the typical firm in the economic census (i.e. the sample for Table 2), and differ in many other ways. Finding results in both samples suggests that political factors affect a wide spectrum of firms. We cannot rule out that the effects are different for the two sets of firms. For example, it remains possible that politicians are forcing small firms to make inefficient hiring decisions, while giving other benefits to large firms that raise their valuation. We cannot test this, because we do not have valuations for small firms, nor high frequency employment for publicly traded firms.

responses in international surveys: (1) Business was visited by government officials in last year; (2) Percentage of senior management's time spent dealing with government officials; (3) Needed an operating license in past year; and (4) Visited by tax officials in last year. The final column creates an index from the first principal component of an eigenvalue decomposition of the previous four variables. All interactions of *aligned*, *margin*, and the bureaucratic indexes are included in the regression, but not displayed for reasons of space. The coefficient of interest is the interaction between *aligned* and the high regulation dummy. The interaction coefficients in all five columns are positive and significant. Firms in industries that depend on bureaucratic inputs are more affected by the alignment of local politicians than firms in industries with less bureaucratic dependence. In fact, we detect no effect of the political variables on firms with low bureaucratic dependence: the uninteracted measure of political alignment is small and indistinguishable from zero. The larger sample size in this regression (and those following) reflects the fact that an observation is now a location-industry group pair, with the industry group defined by the interaction variable.

This result is consistent with the idea that politicians exert political influence through their control of the bureaucracy (Iyer and Mani, 2012), and have the ability to control the enforcement of regulation at a highly local level.[32] This result is discussed further in Section 6.

Procurement contracts to firms are a straightforward way for politicians to narrowly target government resources. The first two columns of Table 8 shows estimates from our primary specification, interacted with industry-level estimates of dependence on procurement. Column 1 uses the procurement measure from Indian data, while column 2 uses international data to classify industries. The interaction of alignment and procurement is not statistically different from zero in either test, and the effect of alignment remains positive and significant

[32]Some anecdotal examples of politician control over bureaucrats are described in Chaudury (2009) and The Hindu (2012).

for low procurement industries. In combination with our null result on public sector employment, this suggests that direct transfers are not a major channel for the effect of political alignment.

Finally, in the class of factors of production, we consider the possibility that politicians are directing credit from state-owned banks to firms in party-aligned locations. Columns 3-6 in Table 8 shows RD estimates interacted with several industry measures of credit dependence and location measures of credit supply. None of the interaction terms of interest are statistically distinguishable from zero, and in most cases the point estimates are negative. Neither demand for credit nor availability of local banks significantly affects the relationship between political alignment and employment growth. An equally important class of factors of production normally supplied by the government is public infrastructure; our results above suggest that are not significantly affected by political alignment.

To control for other industry level factors and firm size, we test the interaction specification in a location-industry group level analysis. We use 2-digit ISIC groups, and apply the mean values of the bureaucratic dependence and credit indexes above, as well a dummy indicating that an industry tends to consist of small firms. Table 9 presents the estimates. The interaction of politician alignment and the regulatory index variable is positive and significant after controlling for firm size and industry dependence on credit.

6 Discussion

This section situates our findings in the context of the literature on state-business interaction in India, and considers possible models that can explain our results.

Our results are consistent with a model of politicians selecting between policy levers to maximize electoral advantage. We reconsider our three mechanisms in this light. Why would strategic politicians prefer regulation as a policy lever over direct transfers or construction

of public infrastructure?

Public infrastructure is not well suited to strategic deployment in the closely contested constituencies studied in this paper. Public infrastructure is very costly, can take many years to build, and can be difficult to target to a single constituency. For example, an electricity line must cut across many constituencies, and would bring the clearest electoral advantage in a region where aligned constituencies are contiguous. If voter preferences are spatially correlated, clusters of aligned constituencies are less likely to have close elections.

Direct transfers to firms and individuals (we investigated procurement and public sector jobs) are more easily targeted, but they impose a financial cost to the government. Our results on procurement suggest either that alignment does not affect the allocation of government contracts, or that government contracts to firms do not have a measurable effect on overall employment. The sample period is a period of government disinvestment and privatization, so large expansions of public sector employment would be unlikely to take place.

Credit from state banks is also highly targetable. Lending in India is known to respond to political cycles (Cole, 2009), and there is evidence from other countries that politicians use state owned banks to reallocate private sector employment growth across legislative constituencies (Carvalho, 2010). Our lack of result on credit suggests either that this tool is too costly for politicians to use, or it does not have a substantial effect on overall employment, perhaps because politically directed lending tends to be unproductive (Khwaja and Mian, 2005).

Why do we find an effect on regulation? According to our conceptual framework, we should find that (i) local bureaucrats have the ability to significantly affect firm activity; and (ii) local politicians can control bureaucrats at low cost.

Bureaucrats in India affect firms through many channels. India is famous for its License Raj, the red tape intensive regime that exerted strict control over production and import

decisions of firms through much of India's history. The 1990s saw significant reductions in licensing requirements, but by objective measures the Indian economy remained highly regulated throughout our sample period (Panagariya, 2008). The presence of red tape gives bureaucrats the ability to hold up formal sector firms that need operating licenses and permits.

Labor regulation is another domain where bureaucrats wield significant power over firms. India's 1947 Industrial Disputes Act requires companies above a certain size to seek government permission before firing any workers (Besley and Burgess, 2004). In practice, MLAs and bureaucrats play key roles as mediators in labor conflict in India. In addition to acting as bottlenecks when firms require government inputs, MLAs and bureaucrats have the ability to initiate tax audits and investigations; they can also control the intensity of investigations that have already begun.[33]

Is control over the bureaucratic process costly to politicians? Politicians have leverage over bureaucrats primarily through their ability to reassign them to less desirable posts (Iyer and Mani, 2012). This implicit threat means that it may cost nothing at all for a politician to control a bureaucrat. In equilibrium, the bureaucrat does a politician's will, and does not need to be reassigned. Enforcement of regulation also has a low political cost because it can be perceived as desirable by voters.

A final piece of evidence consistent with a regulatory channel is Figure 8, which shows that the effect of alignment on firms is concentrated in constituencies narrowly lost by the ruling party. Our framework predicts that the ruling party puts equal value on increasing government inputs to aligned locations and decreasing inputs to non-aligned locations. Regulation is arguably a tool with an asymmetric effect: stricter enforcement of red tape can immediately halt economic activity, while more lenient enforcement may not have the same

[33]In the 2005 Enterprise Survey, 31% of firms disagreed with the statement "Government interpretations of regulation are predictable," and only 12% responded with "Fully agree."

effect on increasing economic activity.[34] Even if politicians put equal effort into tightening regulation in non-aligned constituencies and loosening regulation in aligned constituencies, the economic effects may be greater in the areas where regulation is tightened.[35]

An alternate explanation for an effect of political alignment on employment growth is rooted in contracting. Suppose that local politicians play a key mediating role in the provision of government inputs, and that parties can only monitor politicians from their own party. The seminal red tape model of Banerjee (1997) predicts that the ruling party can improve the allocative efficiency of local services by increasing the level of red tape where agents are more difficult to monitor.[36] Under this model, red tape is increased in non-aligned constituencies, not due to electoral strategy, but as a second best allocative scheme.

This story is consistent with the finding that the effects of alignment are mediated through enforcement of regulation.[37] In the contracting model, however, it is not as clear why the effect of alignment on growth should be limited to swing constituencies, though as discussed above our empirical strategy does not provide clear inference on the importance of the swing effect.

7 Conclusion

Firms in developing countries rely heavily on government inputs, access to which often depends on local politicians and bureaucrats. This paper draws on highly localized firm-level employment data to show that politician identity significantly affects firm growth in

[34] Consider a simple model in which a firm needs to pass multiple bureaucratic processes in order to operate. A barrier to any of these processes will halt firm operation. Removal of barrieres requires more coordination, as all constraints must be loosened before the firm can operate.

[35] Though politicians may also behave asymmetrically toward aligned and non-aligned places: Iyer and Mani (2012) finds that bureaucrats receive more post-election reassignments in non-aligned constituencies.

[36] Banerjee's model describes politicians and bureaucrats, but is equally applicable if local MLAs are central to the provision of government inputs.

[37] An alternate explanation with equivalent predictions is that bureaucrats are beholden to the party in power, and work less efficiently when monitored by unimportant non-aligned MLAs.

India.

Exploiting exogenous variation in politician identity induced by close elections, we show that the alignment of a local politician with the majority party at the state level strongly predicts increased private sector employment growth in the range of 1 to 2 percentage points per year. Further, in the month following elections, firms headquartered in aligned constituencies experience a 12-15% cumulative abnormal return, providing further evidence that political alignment is valuable to firms. However, politician alignment has no measurable effect on the supply of public infrastructure or public sector jobs.

The industries most affected by political alignment are those with a high dependence on bureaucratic inputs, and those likely to meet frequently with government officials. We hypothesize that within a constant state-level regulatory framework, the majority party can control where regulation is and is not enforced, giving the party significant control over local firms. This is consistent with evidence that politicians control bureaucrats through the threat of reassignment.

The evidence supports a model of rational politicians who take into account the costs and benefits of the different policy levers at their disposal. Regulatory discretion is a relatively low cost tool; in equilibrium, bureaucrats will be pliable even if no transfers take place. One major difference between the Indian context and that of studies that have found significant political effects on public infrastructure and public employment where we find none (Albouy, 2009; Cohen et al., 2011; Ferraz and Monteiro, 2010) could be that control over regulation gives Indian politicians a very cheap policy tool that is less easily manipulated in other countries.

Our empirical design does not identify whether the effect of political alignment is distortionary in the aggregate. While visual inspection of Figure 8 suggests that potential jobs are being destroyed in places narrowly lost by the majority party, we cannot determine whether these jobs are disappearing from the economy or shifting to other locations. However, the

mechanism at play may be informative. Control over the intensity of regulatory enforcement is less likely to be distributional than control over public infrastructure. If politicians instruct bureaucrats in some locations to step up enforcement, this need not imply that enforcement in other locations is decreasing.[38] Public infrastructure is much more likely to be budget constrained, such that the construction of a road in one location may well preclude its construction in another.

India is well-known for its history of onerous regulation and barriers to doing business. While the high costs of adhering to regulation for Indian firms have been widely discussed, this paper sheds light on an additional cost of the regulatory state: if political control over regulatory enforcement is cheap, politicians may create additional distortions in pursuit of their electoral interests. This in turn provides an explanation for the persistence of high regulation in India: public officials may be reluctant to give up on a tool that affords them possibilities for rent extraction.

[38]This said, if the equilibrium value of regulation is too low, increases in regulation could be good for citizen welfare, even if they have a negative effect on employment. It is also possible that the party is increasing regulatory enforcement through assignment of stricter bureaucrats, in which case other locations might indeed experience less enforcement.

Table 1
Summary Statistics

Variable	Aligned constituencies	Non-aligned constituencies	t-stat on difference	RD estimate	t-stat on RD estimate
Baseline employment	14099	14292	0.22	-345	-0.21
Baseline public sector employment	2455	2436	-0.10	-34	-0.08
Baseline informal sector employment	12154	12302	0.15	342	0.26
Employment in firms of size <25	11546	11693	0.19	1277	1.21
Mean firm size	2.58	2.64	0.81	-0.22	-0.95
Number of establishments	5619	5750	0.33	588	1.28
Baseline population	172297	159042	-1.23	-515	-0.07
Number of villages	113	101	-1.13	3	0.30
Number of towns	1.05	1.08	0.39	0.09	0.37
Urban population share	0.48	0.47	-0.18	-0.02	-0.29
Share of villages with power supply	0.86	0.84	-0.58	0.06	1.72
Share of villages with tar access road	0.64	0.60	-0.74	-0.04	-1.33
Rural primary schools per village	0.87	0.87	0.04	-0.01	-0.52
Rural hospitals per village	0.03	0.03	-1.12	-0.00	-0.42
Share of land that is irrigated	0.15	0.22	1.74	0.02	0.53
Urban primary schools	14.11	14.22	0.09	5.16	1.46
Urban secondary schools	10.05	9.74	-0.33	2.06	1.10
Urban hospitals	1.38	1.34	-0.21	0.87	0.72
Urban electricity connections	5962	4931	-0.61	2043	1.23
Urban tar roads (km)	20	22	1.17	3	0.67

Table 2
Effect of politician alignment on log employment growth

	Local linear regression			Polynomial regression		
	(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 politician alignment with the state-level governing party on annualized constituency log employment growth from 1990-98 and 1998-2005. Columns 1-3 present local linear estimates (Equation 1), and columns 4-6 present full sample polynomial estimates (Equation 2). Column 1 is the baseline regression on year and state fixed effects. Column 2 adds lagged constituency controls, and column 3 weights observations by baseline employment. Columns 4-6 follow the same pattern. Standard errors are clustered at the state level.

Table 3

Effect of politician alignment on log employment growth: Private sector vs. public sector

	Public Sector Employment			Private Sector Employment		
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 politician alignment with the state-level governing coalition on constituency log employment growth from 1990-98 and 1998-2005. The dependent variable in columns 1-3 is log employment growth in public sector firms. The dependent variable in columns 4-6 is log employment in private sector firms. In each group, the first column includes year and state fixed effects, the second adds lagged constituency controls controls, and the third weights observations by baseline employment. Standard errors are clustered at the state level.

Table 4
Effect of politician alignment on urban public infrastructure

	Roads	Electricity	Primary Schools	Secondary Schools	Hospitals
Aligned	-0.015	0.082	0.113	0.029	0.085
	(0.110)	(0.203)	(0.102)	(0.054)	(0.078)
Margin	-1.869	-0.800	3.852	-4.907	-3.800
	(3.214)	(7.708)	(5.624)	(3.455)	(1.207)***
Margin * Aligned	4.339	-1.125	-3.154	9.009	5.620
	(3.870)	(8.412)	(5.592)	(6.095)	(3.379)
Baseline	-0.027	-0.102	0.442	0.331	-0.084
	(0.064)	(0.178)	(0.189)**	(0.131)**	(0.304)
Constant	-0.000	0.297	-0.013	-0.009	-0.273
	(0.102)	(0.217)	(0.097)	(0.109)	(0.218)
N	465	465	465	465	465
r2	0.20	0.24	0.30	0.36	0.11

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

The table shows kernel regression discontinuity estimates of the effect of politician alignment with the state-level governing coalition on changes in the levels of local urban public infrastructure. The dependent variables have been normalized by the baseline level, so the coefficients can be interpreted as standard deviations. The dependent variables represent the following: (1) km of paved urban roads; (2) number of urban electrical connections; (3) number of primary schools; (4) number of secondary schools; and (5) number of hospitals. All regressions are run at the constituency level, with data aggregated up from individual towns. The data sources are the 1991 and 2001 Population Censuses. All regressions include state fixed effects. Standard errors are clustered at the state level.

Table 5
Effect of politician alignment on rural public infrastructure

	Roads	Electricity	Primary Schools	Irrigation
Aligned	0.036	0.033	0.161	-0.055
	(0.042)	(0.051)	(0.100)	(0.061)
Margin	-2.544	-1.792	1.404	-4.296
	(2.117)	(1.873)	(3.394)	(2.627)
Margin * Aligned	1.916	2.789	-5.672	4.111
	(2.123)	(2.428)	(4.690)	(3.881)
Baseline	-0.678	-0.481	-0.354	-0.255
	(0.109)***	(0.084)***	(0.055)***	(0.066)***
Constant	1.114	0.262	0.364	0.510
	(0.074)***	(0.099)**	(0.061)***	(0.129)***
N	460	460	461	443
r2	0.89	0.64	0.57	0.69

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

The table shows kernel regression discontinuity estimates of the effect of politician alignment with the state-level governing coalition on changes in the levels of local rural public infrastructure. The dependent variables have been normalized by the baseline level, so the coefficients can be interpreted as standard deviations. The dependent variables represent the: (1) share of villages with a paved access road; (2) share of villages with an electricity connection; (3) share of villages with a primary school; (4) share of villages with a hospital; and (5) share of village land that is irrigated. All regressions are run at the constituency level, with data aggregated up from individual villages. The data sources are the 1991 and 2001 Population Censuses. All regressions include state fixed effects. Standard errors are clustered at the state level.

Table 6
Effect of politician alignment on post-election stock returns

	Event study				Placebo Test	
	(1)	(2)	(3)	(4)	(5)	(6)
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 that the winner of the constituency where the firm's headquarters are located is a member of the state-level governing 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 fixed effects. Column 3 adds state and year fixed effects, and column 4 adds state-year fixed effects. Columns 5 and 6 conduct a placebo test, using the cumulative abnormal returns of firms in the month before the election as the dependent variable.

Table 7
Effect of politician alignment on log employment growth, interacted with dependence on bureaucratic inputs

	(1)	(2)	(3)	(4)	(5)
Aligned (RD)	0.001	-0.006	-0.011	-0.002	-0.016
	(0.012)	(0.012)	(0.014)	(0.013)	(0.011)
Aligned * Visited by officials	0.023				
	(0.013)*				
Aligned * Mgmt time with officials		0.012			
		(0.007)*			
Aligned * Need operating license			0.016		
			(0.009)*		
Aligned * Visited by tax office				0.024	
				(0.011)**	
Aligned * Bureaucracy index					0.029
					(0.014)**
Un-interacted bureaucrat measure	0.018	0.056	0.053	0.046	0.036
	(0.011)	(0.015)***	(0.016)***	(0.013)***	(0.016)**
Constant	0.130	0.233	0.216	0.213	0.174
	(0.035)***	(0.029)***	(0.035)***	(0.032)***	(0.040)***
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	State,Year	State,Year	State,Year	State,Year	State,Year
N	1326	1326	1326	1326	1326
r2	0.24	0.26	0.23	0.21	0.27

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

The table shows kernel regression discontinuity estimates of the effect of politician alignment with the state-level governing coalition on annualized log employment growth. The following industry-level measures of dependence of firms on government officials: (Column 1) Business was visited by government officials in last year; (2) % of Sr. mgmt time spent with officials; (3) Needed an operating license in past year; (4) Visited by tax officials in last year. Column 5 is an index consisting of the first principal component of an eigenvector decomposition of the previous four measures. The interaction between the bureaucrat measure and the *aligned* variable indicates the extent to which industries with dependence on bureaucrats are particularly affected by local political alignment. Margin, margin * aligned, and the interaction of these variables with the bureaucracy measures are included in the regression, but not displayed. Standard errors are clustered at the state level.

Table 8
Effect of politician alignment on log employment growth, interacted with measures of credit supply or demand, and procurement

	Procurement		Credit			
	(1)	(2)	(3)	(4)	(5)	(6)
Aligned (RD)	0.019	0.016	-0.003	0.010	0.020	0.017
	(0.012)	(0.009)	(0.018)	(0.011)	(0.010)*	(0.009)*
Aligned * Procurement (India)	-0.012					
	(0.019)					
Aligned * Procurement (Int'l)		-0.003				
		(0.009)				
Aligned * New Loans			0.018			
			(0.015)			
Aligned * Finance demand				0.007		
				(0.013)		
Aligned * Public bank supply					-0.009	
					(0.014)	
Aligned * Credit Index						-0.007
						(0.011)
Constant	-0.130	0.016	0.012	-0.093	-0.014	-0.032
	(0.017)***	(0.015)	(0.028)	(0.015)***	(0.011)	(0.010)***
N	1321	1326	1325	1326	663	1326
r2	0.14	0.20	0.10	0.15	0.17	0.08

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

The table shows kernel regression discontinuity estimates of the effect of politician alignment with the state-level governing coalition on annualized log employment growth. Columns 1 and 2 interact all RD variables with measures of dependence on procurement. In each case, the coefficient of interest is the interaction between *aligned* and the industry measure. Column 1 uses Indian Enterprise Survey data, while column 2 uses international survey data. In columns 3-6, all RD variables are interacted with an industry-level measure of credit demand: (3) Demand for new loans; (4) Bank finance divided by working capital; (5) a location-level measure of the presence of local public sector banks; (6) a credit index consisting of the first principal component of an eigenvalue decomposition of all industry-level credit variables.

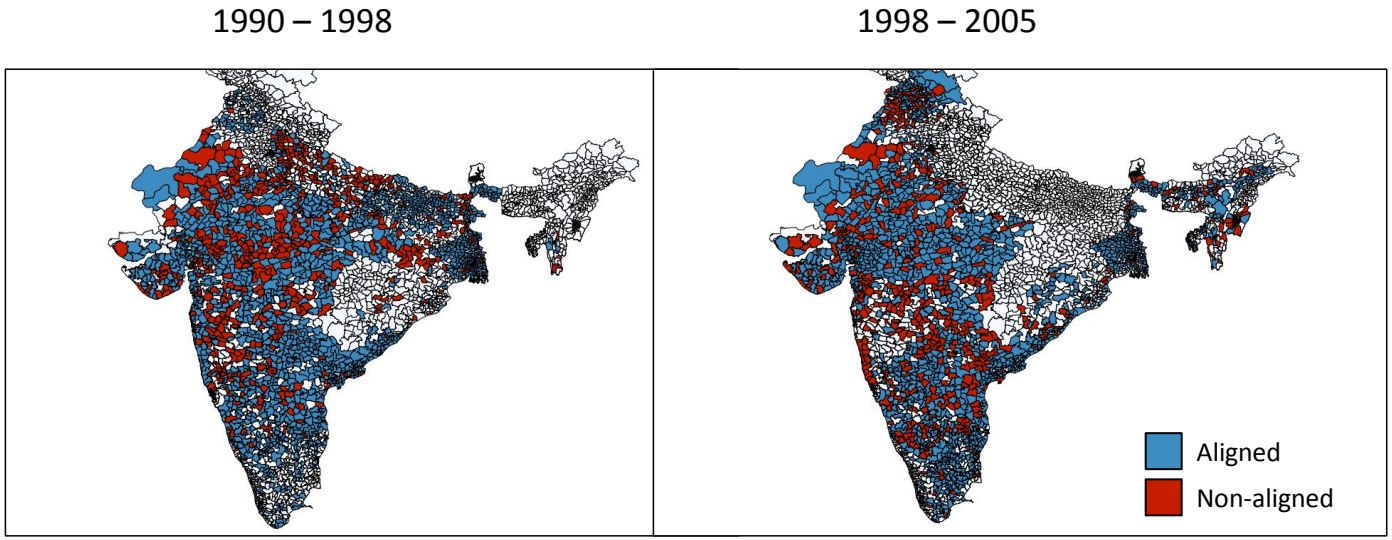
Table 9
Location-industry group level RD Estimates of effect of majority alignment on employment growth

	(1)	(2)	(3)	(4)	(5)
Aligned (RD)	0.004	-0.000	0.039	0.005	0.154
	(0.008)	(0.008)	(0.083)	(0.008)	(0.091)
Margin	-0.087	0.059	-1.569	-0.102	-5.000
	(0.283)	(0.308)	(3.809)	(0.305)	(3.355)
Margin * Aligned	0.378	0.210	0.990	0.300	2.769
	(0.388)	(0.468)	(7.449)	(0.468)	(6.559)
Bureaucrat index * Aligned	0.015			0.016	0.019
	(0.007)**			(0.006)**	(0.007)***
Credit index * Aligned		0.035		-0.009	-0.018
		(0.039)		(0.038)	(0.037)
Small * Aligned			-0.038		-0.163
			(0.091)		(0.101)
Bureaucrat index	0.001			0.050	-0.014
	(0.009)			(0.013)***	(0.008)*
Credit index		0.046		-0.334	-0.052
		(0.049)		(0.039)***	(0.035)
Small			0.427		0.908
			(0.258)		(0.157)***
Constant	-0.087	-0.095	-0.479	-0.045	-0.908
	(0.025)***	(0.023)***	(0.224)**	(0.026)*	(0.137)***
State, year fixed effects	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
N	4326	4326	4326	4326	4326
r2	0.10	0.10	0.10	0.10	0.10

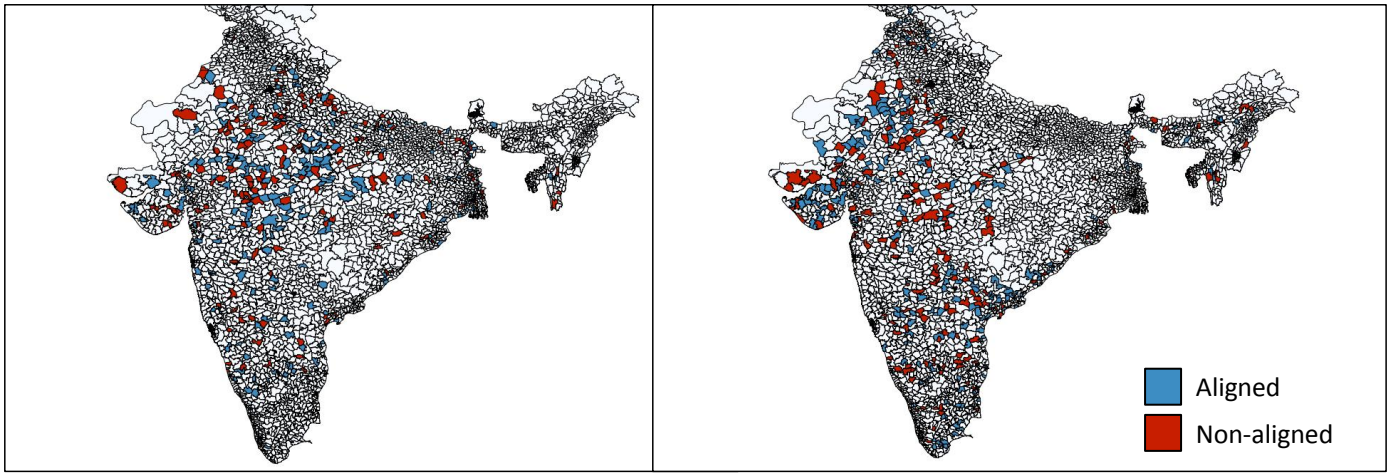
$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

The table shows location-industry group level kernel regression discontinuity estimates of the effect of politician alignment with the state-level governing party on annualized log employment growth. The regression discontinuity variables *aligned*, *margin* and $margin * aligned$ are interacted with an index of industries dependence on bureaucrats, dependence on credit, and to have small mean establishment size. The interaction between the industry-level measures and the *aligned* variable indicates the extent to which that industry is particularly affected by local political alignment. Standard errors are clustered at the state-industry level.

Figure 1
Sample selection

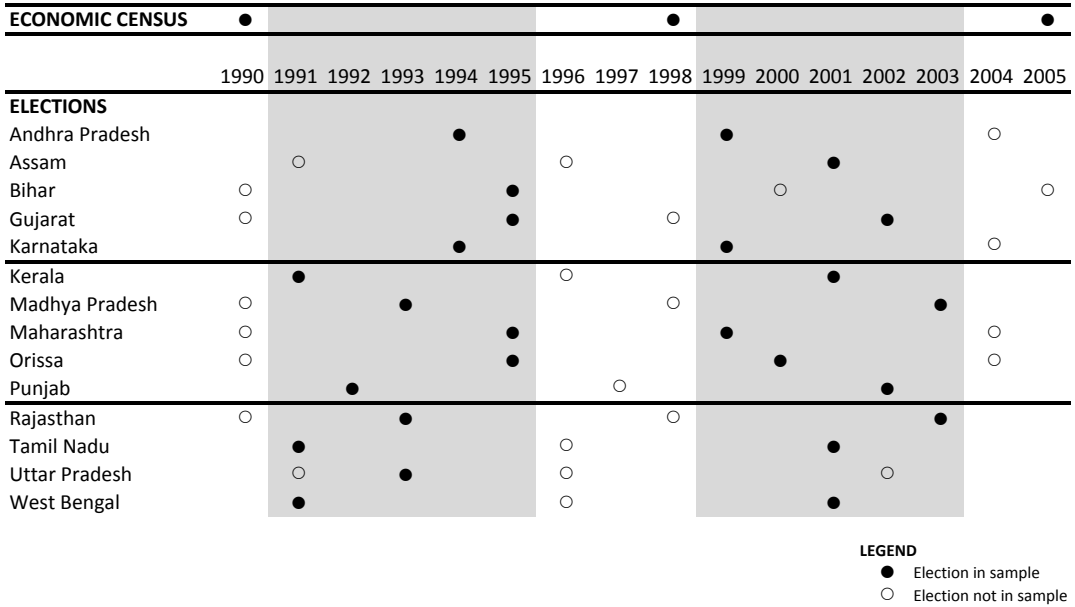


Constituencies with alignment and economic data



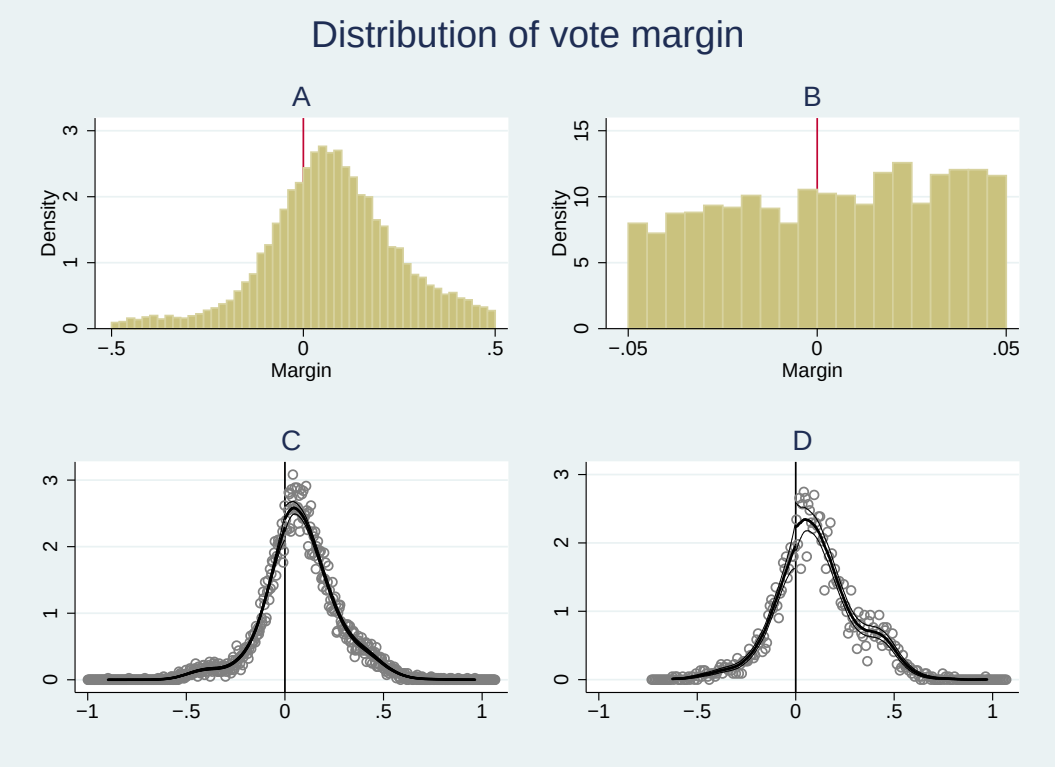
Close elections with economic data

Figure 2
Matching electoral variables to Economic Census rounds



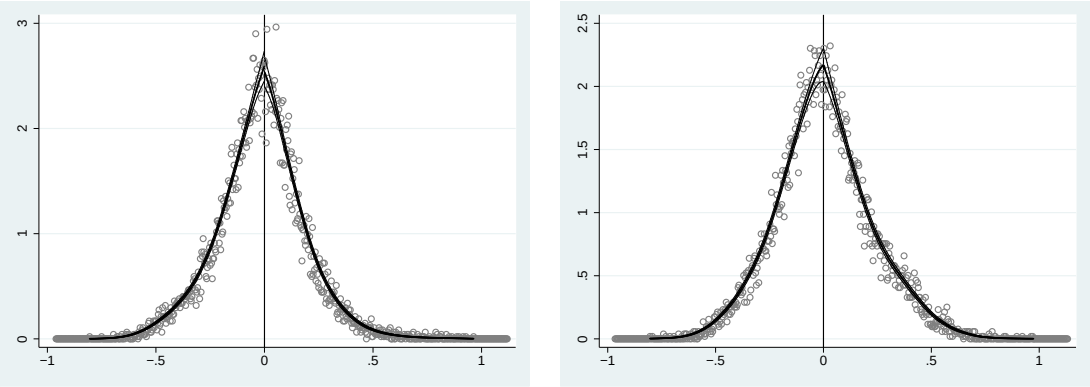
The figure shows the period of years used for construction of variables used from census and electoral data. The economic census was undertaken in 1990, 1998 and 2005. Elections happen at five-year intervals, with dates staggered across states. We explore changes in census values from 1990-98 and from 1998-2005. We match the first election in each state that occurred after the baseline observation period. We exclude elections in Uttar Pradesh in 1991 and 2002 because governments were very short lived. We exclude Assam 1991 because the dominant party was unregistered and ran as independents, making it impossible to code alignment. We exclude Bihar in 2000, because of the large number of post-electoral coalition changes.

Figure 3



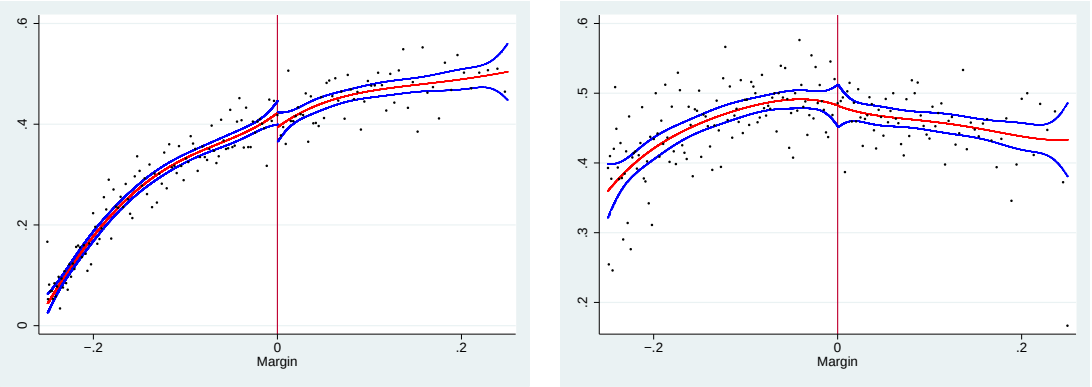
The figure shows the distribution of electoral win margin, defined as vote share of the top candidate aligned with the coalition ruling party minus the vote share of the top non-aligned candidate. Panel A is a histogram of this margin across all Indian elections from 1980-2003. Panel B takes the same 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 used in analysis, which are the locations we were able to match to the Economic Census.

Figure 4
Density functions of electoral performance of potentially structurally advantaged candidates



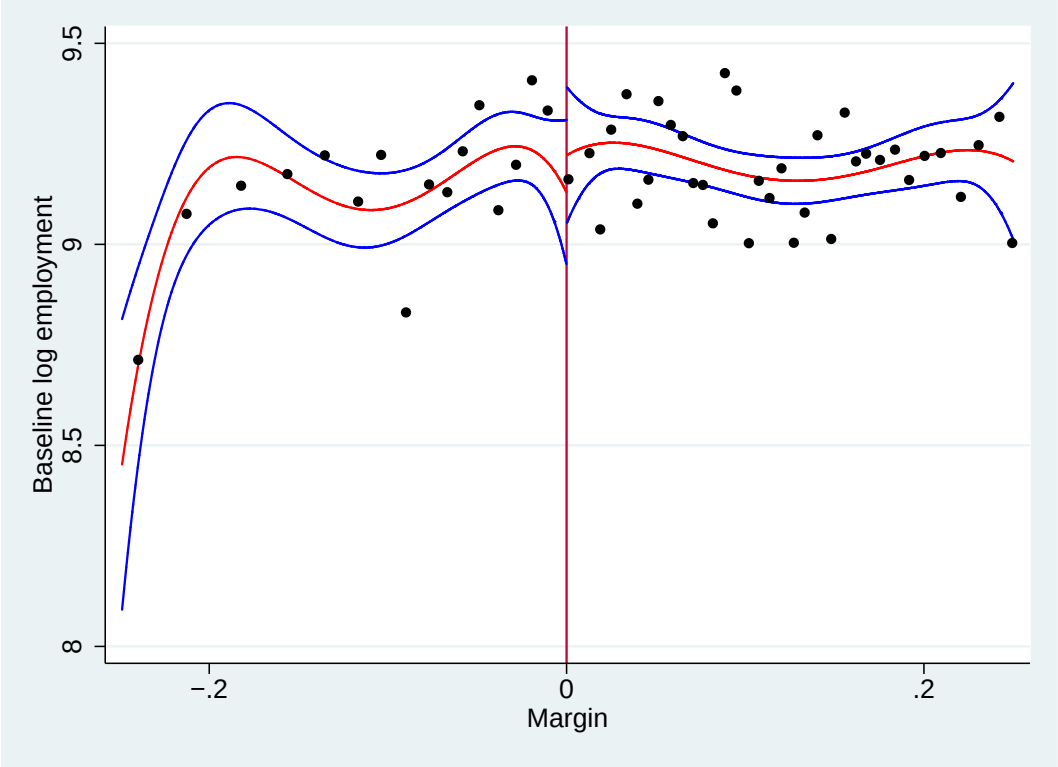
The figure shows the density function of the margin of victory of candidates with a potential structural advantage in an election, as defined in Grimmer et al. (2012), along with a non-parametric smoother and its 95% confidence interval. In the left panel, the X axis is defined as the vote share of the local incumbent minus the top ranking non-incumbent. In the right panel, the X axis is defined as the vote share of the local majority-aligned candidate (from the previous election) minus the top ranking non-incumbent. The sample is all candidates who ran for a legislative seat between 1990 and 2005. If incumbents or majority parties enjoy a structural advantage in close elections, we would expect to see a discontinuity around zero.

Figure 5
Mean structural advantage of candidates and margin of victory/loss



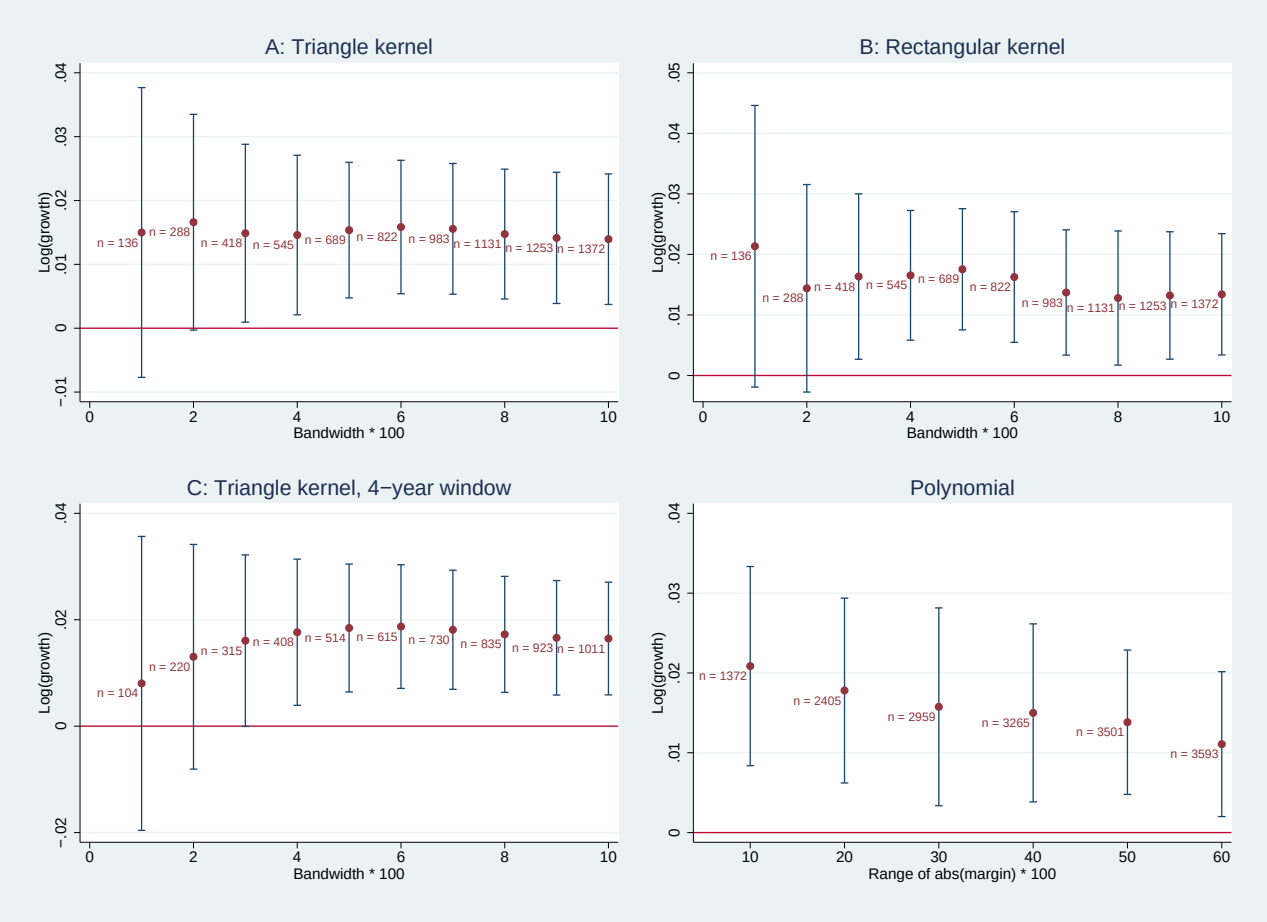
The figure plots the share of candidates with a potential electoral structural advantage (as defined in Grimmer et al. (2012), against their margin of victory or loss. In both panels, margin of victory is defined as the vote share of the local winner minus the 2nd place candidate. Within each percentage point sized bin, the point indicates the share of candidates with that result who were (left panel) incumbents or (right panel) members of the majority party. The sample is all candidates who ran for a legislative seat between 1990 and 2005. If these types of candidates enjoy structural advantages in close elections, these shares should be discontinuously higher to the right of zero.

Figure 6
Placebo test: Baseline log employment vs. majority win margin



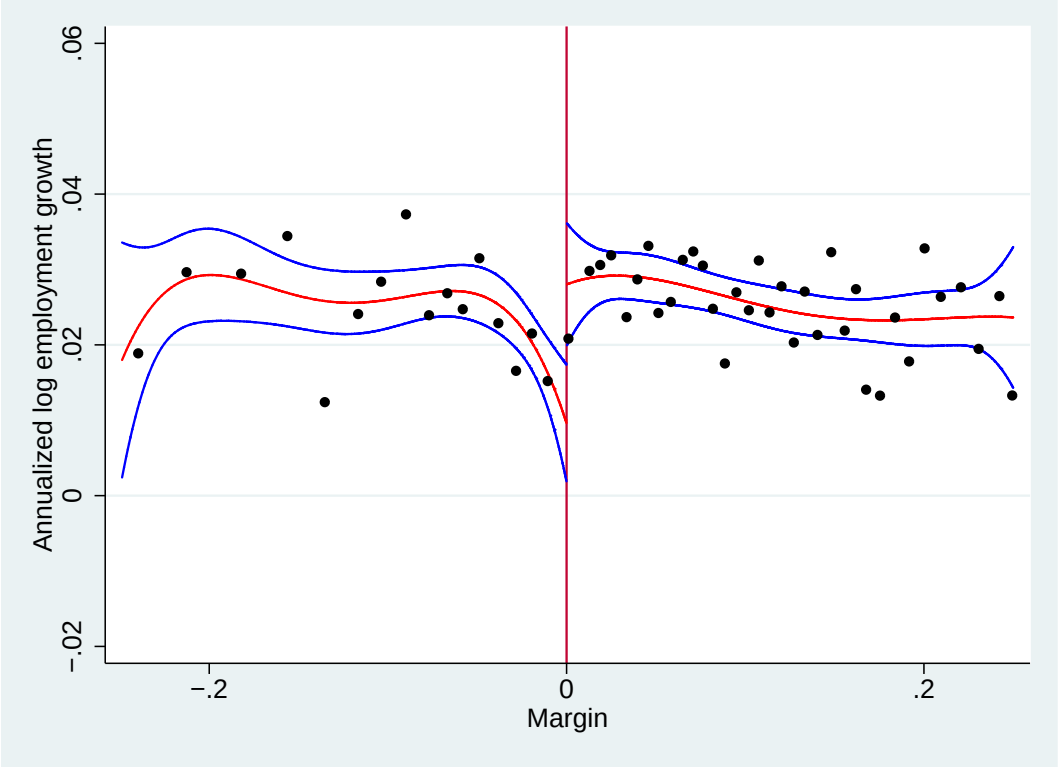
The figure plots the mean of baseline log employment, in constituencies grouped by the win margin of the candidate representing the state-level majority party. Points to the right of zero are seats won by ruling parties, while points to the left of zero are seats lost by ruling parties. Each point represents approximately fifty observations. A 4th degree polynomial function is fitted separately to each side of 0, with 95% confidence intervals displayed.

Figure 7
Robustness of employment effect to alternate specifications



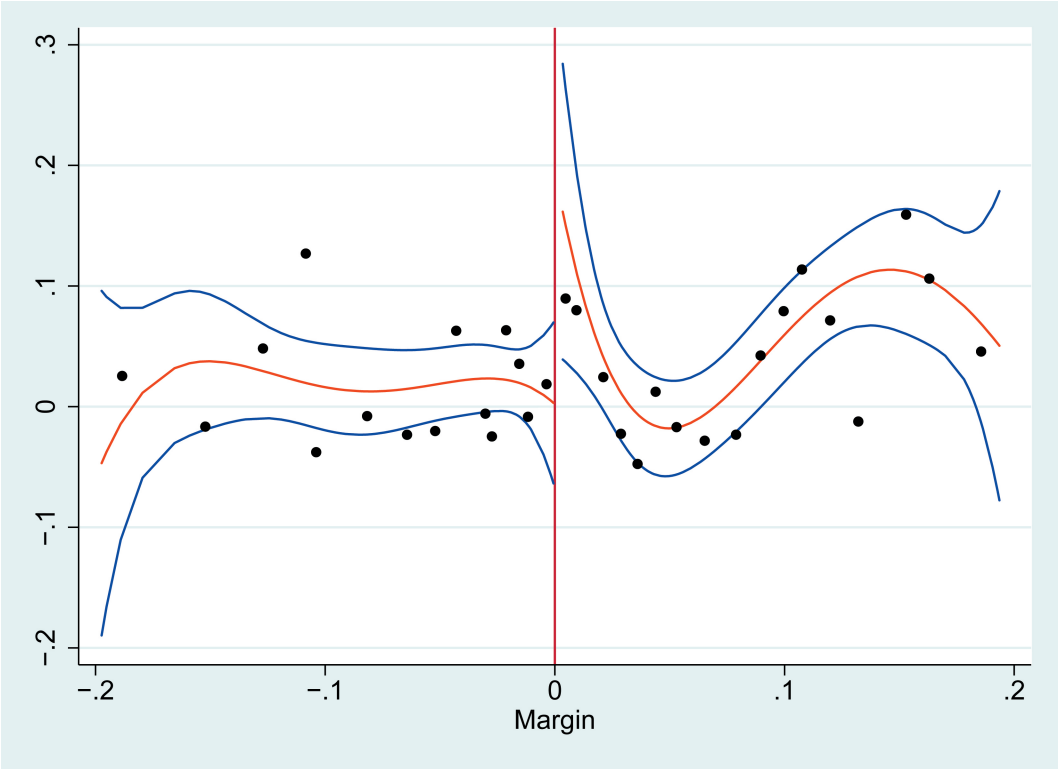
This figure plots the point estimate and 95% confidence interval of the constituency-level treatment effect of alignment with governing party on annualized log employment growth under a range of specifications. Panel A shows the treatment effect of equation 1 with bandwidth on the x-axis. Panel B repeats 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 2. 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.

Figure 8
Log employment growth vs. win margin of governing party candidate



The figure plots the mean of log employment growth, in constituencies grouped by the win margin of the candidate representing the state-level governing party. Points to the right of zero indicate growth in locations won by the governing party candidate, while points to the left of zero indicate growth in locations lost by the governing party candidate. There are approximately fifty observations in each bin. A 4th degree polynomial function is fitted separately to each side of 0, and 95% confidence intervals are displayed.

Figure 9
Cumulative abnormal returns vs. win margin of governing party candidate



The figure plots the mean of stock cumulative abnormal returns, adjusted for a market model, grouped by the win margin of the candidate representing the state-level governing party. Points to the right of zero indicate growth in locations won by the governing party candidate, while points to the left of zero indicate growth in locations lost by the governing party candidate. There are approximately twenty-five observations in each bin. A 4th degree polynomial function is fitted separately to each side of 0, and 95% confidence intervals are displayed. The sample is all public traded firms with headquarters in towns not larger than a constituency.

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A Appendix: model

There are two parties, A and B, with respective policies on a one-dimensional continuum, X_A and X_B. Without loss of generality, let A by the majority party. The majority party allocates a fixed amount of government resources across K constituencies, assigning γ_k to constituency k, subject to the budget constraint $\sum_{k=1}^{K} \gamma_k = 1$.

Each constituency has two politicians, characterized by an inherent ability $\theta_{i,k}$ where $\theta \in [0,1]$, $\mathbb{E}(\theta) = 0.5$ and $i \in \{A, B\}$. This represents the politician's ability to bring useful government inputs to his constituency. After allocations have been decided by the central party, the value of government inputs received by voters in constituency k is equal to $\gamma_k \cdot \theta_{I,k}$, where I represents the incumbent politician in constituency k. A low ability candidate dissipates the value of government inputs; this could be because he allows them to be stolen, or because he obtains inputs that are not useful to his constituency. All candidates are committed to the policy position of their party.

Voter j in constituency k is characterized by a policy position $X_{j,k}$. Voter j's value of voting for candidate i is determined by a convex function of the cost of a candidate's distance from the voter's optimal policy, and a linear preference for candidate quality, as given by the following utility function:

$$U_{j,k,i} = (X_i - X_{j,k})^2 + \hat{\theta}_{i,k},$$

where $\hat{\theta}_{i,k}$ is a voter's perception of the ability of candidate i in constituency k.

Taking a probabilistic voting approach, the probability that candidate A is elected is given by:

$$P(\text{A wins}) = \Phi\left(-(X_A - X_{M,k})^2 + (X_B - X_{M,k})^2 + \hat{\theta}_{A,k} - \hat{\theta}_{B,k}\right),$$

where $\Phi()$ is the normal c.d.f. and $X_{M,k}$ is the optimal policy of the median voter in constituency k. Candidate ability affects success only if the median voter does not have strong preferences for either party position.

Voters cannot observe a candidate's θ; they can only see $\gamma \cdot \theta$, which is the final value of government inputs received. Voters discount their observation of government inputs received by their prediction of γ_k as follows:

$$\hat{\theta}_{I,k} = \frac{\gamma_k \cdot \theta_{I,k}}{\hat{\gamma}_k}.$$

The party seeks to maximize the probability of re-election, paying a convex cost of deviating from equal provision of inputs to all constituencies.[39] The party's optimization problem is as follows (assuming A controls the government):

$$\max_{\{\gamma_1,\gamma_2,\ldots,\gamma_K\}} \sum_{k=1}^{K} \gamma_k^{\alpha} + P(\text{A wins}|\gamma_k, X_{M,k}, \hat{\theta}_{A,k}, \hat{\theta}_{B,k}),$$

where

$$P(\text{A wins}|\gamma_k, X_{M,k}, \hat{\theta}_{A,k}, \hat{\theta}_{B,k}) = \Phi\left((X_B - X_{M,k})^2 - (X_A - X_{M,k})^2 + \hat{\theta}_{A,k}(\gamma_k) - \hat{\theta}_{B,k}(\gamma_k)\right).$$

Voters estimate candidate ability as:

$$\hat{\theta}_{i,k}(\gamma_k) = \begin{cases} \frac{\theta_{i,k} \cdot \gamma_k}{\hat{\gamma}_k} & \text{if } i \text{ is the incumbent} \\ \mathbb{E}(\theta) & \text{if } i \text{ is not the incumbent} \end{cases}.$$

[39] This cost could reflect a preference for citizen welfare, a political cost of appearing to engage in patronage, or simply an administrative cost of distorting the allocation of inputs from a default level.

Denote the median voter's preference of policy A over policy B as:

$$\eta_k = (X_B - X_{M,k})^2 - (X_A - X_{M,k})^2$$

The first order condition defines the relationship between the supply of government inputs across two constituencies:

$$\alpha\gamma_k^{*\alpha-1} + \phi\left(\eta_k + \hat{\theta}_{A,k} - \hat{\theta}_{B,k}\right)\left(\frac{\partial\hat{\theta}_{A,k}}{\partial\gamma_k} - \frac{\partial\hat{\theta}_{B,k}}{\partial\gamma_k}\right) = \alpha\gamma_l^{*\alpha-1} + \phi\left(\eta_l + \hat{\theta}_{A,l} - \hat{\theta}_{B,l}\right)\left(\frac{\partial\hat{\theta}_{A,l}}{\partial\gamma_l} - \frac{\partial\hat{\theta}_{B,l}}{\partial\gamma_l}\right).$$

The first term indicates the cost of deviating from equal provision. The density function ϕ indicates the marginal electoral return from getting more votes in constituency k: if $|\eta_k|$ is large, then $\phi = 0$ and the party cannot affect the outcome in this location. Provision of inputs will be equal to all non-swing constituencies.

The final term indicates the party's ability to shift voters' perceptions of the quality difference between the candidates. This depends on incumbency, as government spending does not affect perceptions of the non-incumbent candidate:

$$\left(\frac{\partial\hat{\theta}_{A,k}}{\partial\gamma_k} - \frac{\partial\hat{\theta}_{B,k}}{\partial\gamma_k}\right) = \begin{cases} \frac{\theta_{A,k}}{\hat{\gamma}_k} & \text{if A is the incumbent} \\ -\frac{\theta_{B,k}}{\hat{\gamma}_k} & \text{if B is the incumbent} \end{cases}$$

Comparing two aligned constituencies, we get the expression:

$$\alpha\gamma_k^{*\alpha-1} + \phi_k(\cdot)\left(\frac{\theta_{A,k}}{\hat{\gamma}_k}\right) = \alpha\gamma_l^{*\alpha-1} + \phi_k(\cdot)\left(\frac{\theta_{A,l}}{\hat{\gamma}_l}\right),$$

indicating that the candidate in a closer election (indicated by a larger value of $\phi_k(\cdot)$) will receive more resources. Conversely, comparing two non-aligned constituencies, only a sign changes, and the candidate in a closer election will receive fewer resources.[40]

[40] Another implication of the model which we do not exploit is that if the party can observe ability, then

Comparing an aligned and a non-aligned constituency, we find:

$$\alpha\gamma_k^{*\alpha-1} + \phi(\cdot)\left(\frac{\theta_{A,k}}{\hat{\gamma}_k}\right) = \alpha\gamma_l^{*\alpha-1} + \phi(\cdot)\left(-\frac{\theta_{B,l}}{\hat{\gamma}_l}\right).$$

The aligned constituency will receive more spending than the non-aligned constituency, but only if one of the two elections is close. The differential is highest if elections are close in both constituencies.

Note that this model does not rely on voters' misunderstanding of party strategy. The party's optimal strategy depends on the distribution of $\hat{\gamma}_k$, but the signs of the comparative statics above are unchanged if we allow fully rational voters, such that $\hat{\gamma}_k = \gamma_k^*$. Voters expect electoral strategy to affect the distribution of government resources (consistent with our results on stock prices), and so they discount the signal received in swing constituencies. But this discounting does not obviate the need for strategic spending - if the party ignores strategy while voters expect it, then swing voters' perceptions of aligned candidates will be biased downward. This result is analogous to the finding that firms manipulate their earnings reports in equilibrium even if investors are aware that manipulation is taking place.

higher ability aligned candidates will receive more resources, as the higher θ makes those resources more visible to voters. Conversely, high ability non-aligned candidates receive fewer resources for the same reason.

B Appendix: Coalitions and multiple candidates

This section describes how we extend the 2-party empirical strategy in section 4 to a situation with more than two parties and coalitions which may change after election results are revealed.

Assume that candidates from N parties contest the election in a given constituency, one of whom is aligned with the ruling party. $margin$ is now defined as the scaled vote distance from the aligned candidate to the non-aligned candidate with the highest number of votes:

$$margin_{cst} = \frac{v^{a}_{cst} - v^{maxn}_{cst}}{v^{tot}_{cst}},$$

where v^{maxn}_{cst} is the vote share of the non-aligned candidate with the highest number of votes. $margin$ can now be interpreted as the share of votes that would need to be changed to turn an aligned constituency into a non-aligned constituency, or vice versa. As before, $margin$ is positive for aligned constituencies, negative for non-aligned constituencies, and elections are closest when $|margin|$ is small.

The formation of coalitions presents a potential source of bias to our identification strategy. Coalitions may be formed before or after an election. If a coalition forms after an election, it is possible that unobserved characteristics of a successful candidate may affect both her likelihood of joining the governing coalition, and economic outcomes in her constituency. For example, if small parties with high ability candidates are more likely to join governing coalitions, Equation 1 could overestimate the effect of alignment.

To eliminate this bias, we define coalitions of parties strictly on the basis of information that was known before an election takes place. In many cases, alliances of parties are announced in advance; when possible, we define coalitions according to this information, which we collected from news reports. We then treat coalitions of parties as a single party. When we are unable to find information on coalitions before the election, we predict party

alliances on the basis of the previous election in the same state.

In cases where coalitions have shifted during the electoral cycle, this method may incorrectly label coalition parties as non-coalition and vice versa. This contaminates the RD design, biasing our estimates toward zero. The bias is most likely small: we accurately predict candidate alignment in 88% of cases.

C Appendix: Additional figures and tables

Table 10
Placebo regression discontinuity estimates at sample quartiles

	1	2	3	4	5	6
Aligned (RD)	-0.005	-0.005	0.003	0.001	-0.001	0.001
	(0.006)	(0.004)	(0.003)	(0.008)	(0.006)	(0.004)
Margin	0.166	0.160	-0.031	-0.388	-0.310	-0.077
	(0.219)	(0.202)	(0.035)	(0.279)	(0.216)	(0.048)
Margin * Aligned	-0.120	-0.098	-0.048	0.726	0.631	0.114
	(0.459)	(0.369)	(0.073)	(0.388)*	(0.308)*	(0.043)**
Baseline		-0.014	-0.018		-0.019	-0.018
		(0.004)***	(0.003)***		(0.005)***	(0.003)***
Constant	0.017	0.113	0.199	0.021	0.191	0.199
	(0.006)***	(0.038)***	(0.025)***	(0.008)**	(0.046)***	(0.027)***
N	512	512	3625	617	617	3625
r2	0.17	0.30	0.19	0.14	0.25	0.20

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

The table shows placebo kernel regression discontinuity estimates of Equation 2. Columns 1-3 estimate a discontinuity at the median margin below zero, and columns 4-6 estimate a discontinuity at the median margin above zero. Columns 1 and 4 estimate local linear regressions with state and year fixed effects. Columns 2 and 5 add lagged constituency controls. Columns 3 and 6 estimate polynomial functions across the full range of the margin distribution. Standard errors are clustered at the state level.

Table 11
RD Estimates of effect of majority alignment on employment growth, polynomial fits of local linear regression

	1	2	3	4	5	6
Aligned (RD)	0.014	0.015	0.015	0.014	0.017	0.015
	(0.008)*	(0.007)**	(0.007)**	(0.010)	(0.009)*	(0.009)
Margin	-0.573	-0.686	-0.667	-2.124	-1.881	-1.587
	(0.646)	(0.603)	(0.601)	(1.477)	(1.393)	(1.389)
Margin * Aligned	0.942	0.878	0.892	3.831	2.701	2.532
	(0.924)	(0.863)	(0.859)	(2.149)*	(2.022)	(2.012)
Margin^2	-8.913	-12.205	-11.118	-109.892	-89.739	-70.661
	(16.845)	(15.711)	(15.656)	(88.142)	(82.981)	(82.659)
Margin^2 * Aligned	-1.304	4.609	2.728	18.924	44.063	18.657
	(22.830)	(21.303)	(21.198)	(122.251)	(113.924)	(113.122)
Baseline		-0.023	-0.023		-0.023	-0.023
		(0.003)***	(0.003)***		(0.003)***	(0.003)***
Margin^3				-1678.439	-1285.170	-986.221
				(1438.427)	(1351.254)	(1345.630)
Margin^3 * Aligned				2957.299	1889.683	1678.102
				(1973.944)	(1857.160)	(1846.876)
Constant	0.003	0.206	0.200	-0.011	0.195	0.192
	(0.087)	(0.084)**	(0.087)**	(0.087)	(0.085)**	(0.088)**
Weighted	No	No	Yes	No	No	Yes
Controls	No	Yes	Yes	No	Yes	Yes
N	663	663	663	663	663	663
r2	0.13	0.26	0.25	0.13	0.26	0.25

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

The table shows kernel regression discontinuity estimates of the effect of politician alignment with the state-level governing coalition on annualized constituency log employment growth from 1990-98 and 1998-2005. Polynomial functions of margin are included as controls instead of linear functions. Columns 1-3 present local linear estimates with quadratic controls in margin of victory. Columns 4-6 present local linear estimates with 3rd degree controls in margin of victory. Column 1 is the baseline regression on year and state fixed effects. Column 2 adds lagged constituency controls, and column 3 weights observations by baseline employment. Columns 4-6 follow the same pattern. Standard errors are clustered at the state level.

Table 12
Event study estimates of CAR in month following election of aligned candidate, full sample rectangular kernel

	Event study				Placebo Test	
	(1)	(2)	(3)	(4)	(5)	(6)
Aligned	0.024	0.032	0.037	0.047	0.003	0.001
	(0.017)	(0.020)	(0.021)*	(0.025)*	(0.020)	(0.012)
Constant	0.017	-0.048	-0.122	-0.179	-0.018	-0.008
	(0.021)	(0.022)**	(0.050)**	(0.033)***	(0.016)	(0.016)
Fixed Effects	None	State	State,Year	State * Year	None	State * Year
N	710	710	710	710	710	710
r2	0.00	0.08	0.17	0.23	0.00	0.17

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

The table shows estimates of cumulative abnormal returns of publicly traded firms in the month following an election. The independent variable *aligned* indicates that the winner of the constituency where the firm's headquarters are located is a member of the state-level governing coalition. Returns are measured against a market model with a value weighted index of Indian securities representing the market. The sample consists of all firm-election pairs in constituency- or smaller-sized towns in 1990-2005. Column 1 is the baseline model without fixed effects. Column 2 adds state fixed effects. Column 3 adds state and year fixed effects, and column 4 adds state-year fixed effects. Columns 5 and 6 conduct a placebo test, using the cumulative abnormal returns of firms in the month before the election as the dependent variable.