Jai Ho? The Impact of a Large Public Works Program on the Government's Election Performance in India

Laura Zimmermann *
University of Michigan

November 2012

Abstract

Many developing-country governments seem reluctant to commit to improving the living conditions of the poor by introducing ambitious anti-poverty programs. One potential reason for this is the lack of electoral benefits from such a strategy. This paper analyzes the impact of NREGS, one of the world's biggest anti-poverty programs, on the government's election performance in India. The results suggest that the government does benefit from NREGS, but that mere lip-service to improving the plight of the poor is not sufficient to ensure electoral success: Information constraints and growing dissatisfaction with implementation problems of the program seem to be important limitations.

keywords: NREGS, election outcomes, India, anti-poverty programs, voting behavior

JEL Codes: D72, H53, I38

*email:lvzimmer@umich.edu.

1 Introduction

The political scene in many developing countries today is characterized by a constellation of elite-dominated governments and political parties, but mostly poor potential voters. The average citizen is unable to successfully lobby for policy initiatives through interest groups or to put pressure on policymakers through other channels. Therefore, elections are typically the main opportunity for the poor to influence government policies and to hold electoral leaders accountable for their past behavior. Elections often take place in environments with extensive patronage networks and vote buying, however, and political parties are often accused of paying lip service to their commitment to anti-poverty policies during their election campaigns without any intention to make significant efforts to reduce poverty once in office.

One potential explanation for this pattern is that political parties have no incentive to implement ambitious anti-poverty programs because they do not affect electoral outcomes. Therefore, they may not be a utility-maximizing strategy for parties vying for political power. In contexts where election results are importantly influenced by parties' abilities to have a functioning patronage network or to have large sums of money available for vote buying, for example, catering to local elites may be more important for re-election purposes than improving the living situation of the poor.

An important but very understudied research question in economics is therefore whether large anti-poverty programs have a significant impact on electoral outcomes. If this is the case, then this is evidence that citizens do hold politicians accountable for major policy initiatives. It would also suggest the rise of what political scientists call 'programmatic politics' where patronage networks alone are no longer sufficient to win elections, and would therefore point towards a deepening of democracy.

In this paper, I analyze this question in the Indian context. The National Rural Employment Guarantee Scheme (NREGS) that was introduced by the Indian government

in 2006 is one of the largest and most ambitious public-works programs in the world and legally guarantees each rural household up to 100 days of manual public-sector work at the minimum wage. Despite a number of implementation problems, the scheme is usually thought to have had important benefits for the rural poor. Importantly, the main government party played up the success of the scheme in its general election campaign, and the party itself as well as some experts and members of the popular press believe that NREGS was one of the main reasons for the surprising landslide victory of the government parties in 2009.

Using a regression discontinuity framework that exploits variation in the timing of the introduction of NREGS, I find that the program does seem to have had an impact on election outcomes. The results suggest an inverse U-shaped pattern in the relationship of the duration of NREGS and votes for the government parties. This is muted or even reversed if national government parties are also in power at the state level, and in areas where the program is well-implemented. The success of the government parties due to NREGS comes at the expense of the parties on the left, but does not seem to have majorly impacted the election results for the main national competitor of the government coalition.

The results are consistent with a story in which it takes some time for voters to learn about NREGS and its benefits, but where voters realize the practical limitations of the program after having had the scheme for some time and become less enthusiastic about NREGS. Both more local political influence of the government at the state level and a better implementation of the scheme seem to help in muting the problems in early and late implementation districts, potentially by lowering information constraints in new areas and by ensuring a higher level of satisfaction with the scheme in longer-established NREGS districts.

Overall, these results suggest that there is an electoral benefit for implementing

ambitious anti-poverty programs in India, but that those benefits may only last if the government resolves practical implementation issues. The paper contributes to the literature on the relationship of economic and welfare government programs as well as public goods provision on the one hand and election outcomes on the other hand. While most papers in that area focus on the impact of elections on government programs, this paper provides evidence for an important causal effect in the opposite direction.[1] It is also related to the corruption literature insofar as the results suggest that voters are aware of implementation issues and are not satisfied with low-quality initiatives.

The rest of this paper is organized as follows: Section 2 provides some background information about the working of NREGS and the Indian electoral system. Section 3 discusses the rollout of NREGS and the empirical estimation strategy. Section 4 presents the data sources and some summary statistics. Section 5 discusses the results as well as some extensions. Section 6 concludes.

2 Background

2.1 NREGS

The National Rural Employment Guarantee Scheme (NREGS)[2] is one of the largest and most ambitious government anti-poverty programs in the world.[3] The scheme is based on the National Rural Employment Guarantee Act (NREGA) which was passed in the Indian parliament in August 2005 and which provides a legal guarantee of up to 100 days of manual public-sector work per year at the minimum wage for each

[1] See e.g. Besley, Pande and Rao 2012, Dunning and Nilekani 2012, Ferraz and Finan 2011

[2] The program was renamed to Mahatma Gandhi National Rural Employment Guarantee Scheme in 2009. Since the abbreviations NREGA and NREGS are more estiablished in the literature, however, I will keep referring to the program as NREGS.

[3] For more details on the scheme see e.g. Dey et al. (2006), Government of India (2009), and Ministry of Rural Development (2010).

rural household[4]. There are no other eligibility criteria, so households self-select into NREGS work. They can apply for work at any time. Men and women are paid equally, and at any given time at least one third of the NREGS workforce is supposed to be female. Wages are the state minimum wage for agricultural laborers, although NREGA specifies a floor minimum wage.[5] Wages need to be paid within 15 days of the day the work was performed, otherwise the worker is eligible for unemployment allowance. The focus of NREGS projects is on the improvement of local infrastructure and anti-drought measures.

NREGS was rolled out across India in three phases: 200 districts received the program in February 2006 (Phase 1), 130 additional districts started implementing the scheme in April 2007 (Phase 2), and the remaining districts got NREGS in April 2008 (Phase 3). NREGS is now operating in 99 percent of Indian districts since it excludes districts with a 100 percent urban population (Ministry of Rural Development 2010).

NREGS has received widespread attention in the popular press and in academic research. An increasing number of papers in economics analyzes the impact of the program on rural labor markets. Imbert and Papp (2012) use a difference-in-difference approach to look at the program's impact on wages and employment, comparing Phase 1 and Phase 2 districts to the Phase 3 districts that had not yet received the program in 2007/08 and therefore function as control districts. They find that NREGA increases employment by 0.3 days per prime-aged adult and private-sector wages by 4.5 percent, with the impacts concentrated during the agricultural off-season. Azam (2012) also uses a difference-in-difference approach, and finds that public sector employment increases by 2.5 percent while wages for males and females increase by 1 and 8 percent, respectively. In other variation of the difference-in-difference design, Berg et al. (2012)

[4]The year is the financial year and starts on April 1.

[5]The NREGS minimum wage was originally Rs.60, but has been raised various times since then. It was Rs.120 in 2009.

analyze the impact of NREGS on agricultural wages by using monthly information on agricultural wages from 2000 to 2011. The results in the paper suggest that agricultural wages have increased by about 5 percent, but that it takes between 6 and 11 months for these wage effects to be realized. All of these papers need to rely on some version of the parallel trend assumption in their analysis, which may well be violated in practice since the NREGS rollout was non-random.[6] Zimmermann (2012) uses the regression-discontinuity framework also applied in this paper instead, and finds much less evidence for substantial wage increases, although the time frame of the analysis would be consistent with Berg et al.'s finding that wage effects may take some time to take effect. The paper also finds no significant employment effects, although this result may be partly driven by statistical power issues.

Economic research has also analyzed practical implementation issues of NREGS that limit the effectiveness of the legal guarantee provided by the government: Dutta et al. (2012), for example, show that NREGS employment is often rationed since demand often far outstrips supply, and document that this is especially common in poorer states. Niehaus and Sukhtankar (2012a and 2012b) analyze the existence and characteristics of corruption in the implementation of NREGS in the Indian state Orissa, and find that an increase in the minimum wage was not passed through to workers.

Some research shows, on the other hand, that NREGS seems to be implemented quite well in the state Andhra Pradesh: Johnson (2009a) finds that NREGS seems to provide a safety net for rural households since take-up of the program increases after negative rainfall shocks. Johnson (2009b) finds that the working of NREGS does not seem to be majorly affected by the specific parties in power at the local panchayat level.

Overall, existing research suggests that despite major practical limitations NREGS generates some important benefits for the rural poor.

[6] More details are provided in the next section.

2.2 India's Political System and the General Elections of 2009

India's electoral system works according to the first-past-the-post system, meaning that the candidate with a plurality of the votes in a given constituency receives the seat in the Lok Sabha, the Indian parliament's lower house. Candidates can therefore be elected with much less than majority support, and the seat allocation can differ substantially from the allocation that would prevail under a proportional representation system. While the first-past-the-post system is often associated with few parliamentary parties, the last two decades have seen the rise of national coalition governments in India: The two big national parties, the Indian National Congress (INC) and the Bharatiya Janata Party (BJP) have created alliances with smaller parties to create working government coalitions called the United Progressive Alliance (UPA) and the National Democratic Alliance (NDA), respectively (see for example Yadav 1999). Even then governments do not always have a majority of seats in Parliament, however. The UPA government elected in 2004, for example, depended on external support from the Left Front (an alliance of left-wing parties)[7] as well as that of two other parties[8].

The membership of parties in the UPA and NDA has varied over the years. To the extent that small parties commit to a certain alliance before an election, parties often negotiate seat sharing agreements so that parties do not contest seats in all electoral constituencies and thus minimize vote-splitting between members of the same alliance. Additional negotiations can take place after elections, however, and small parties have also left government coalitions or changed alliances.

The UPA won the general elections in 2004 and followed the previous NDA coalition government. The government coalition included the INC as the main national party

[7]The Left Front includes the Communist Party of India (Marxist), the Communist Party of India, the Revolutionary Socialist Party, and the All India Forward Bloc.

[8]The Bahujan Samaj Party and the Samajwadi Party.

as well as 13 smaller parties with mostly regional strongholds.[9] The UPA membership before the 2009 general election differed from this composition after some parties left the coalition and new parties made agreements for the general elections, but since my research question focuses on the electoral benefits of a government program passed in parliament in 2005 I stick to the initial UPA composition for my empirical analysis.

For administrative and security reasons, the general elections of 2009 were held in five phases between April 16 and May 13. The election results were announced on May 16.[10] Pre-polls had suggested a close race between UPA and NDA with a slight edge for the UPA, so the strong performance of the UPA, and the INC in particular, came as a suprise for most experts (see for example Ramani 2009): The UPA won 262 of the 543 seats (2004: 218)[11], with INC winning 206 seats, an increase of 61 seats relative to the 2004 election results. The NDA, on the other hand, lost support and only won 159 seats (2004: 181 seats).[12] The Left Front also did much worse than predicted and won 79 seats.

The popular press as well as academic experts have advanced a number of hypotheses to explain the unexpectedly strong performance of the UPA, and INC in particular. These include the strong leadership skills of INC leaders Sonia and Rahul Gandhi, the competent and corruption-free image of prime minister Manmohan Singh, as well as intra-party problems in the BJP and regional factors (see for example EPW 2009,

[9]The small UPA member parties of the 2004 government are: Rashtriya Janata Dal, Dravida Munnetra Kazhagam, Nationalist Congress Party, Pattali Makkal Katchi, Telangana Rashtra Samithi, Jharkhand Mukti Morcha, Marumalarchi Dravida Munnetra Kazhagam, Lok Jan Shakti Party, Indian Union Muslim League, Jammu and Kashmir Peoples Democratic Party, Republican Party of India, All India Majlis-e-Ittehadul Muslimen, Kerala Congress (Times of India, 2006). Before the 2009 general elections, four parties left the government coalition: Telangana Rashtra Samithi, Marumalarchi Dravida Munnetra Kazhagam, Jammu and Kashmir Peoples Democratic Party, and Pattali Makkal Katchi. The empirical results are robust to excluding these parties from the UPA definition. Additional parties joined the UPA for 2009 elections, but I use the 2004 definition for my empirical analysis.

[10]Election dates are set, and elections monitored, by the autonomous Election Commission.

[11]The absolute majority is 272 seats, so the UPA government is still reliant on external support. The UPA received 37.22 percent of the total vote (2004: 35.4 percent).

[12]24.63 percent of the votes (2004: 33.3 percent). NDA's biggest party and INC's main competitor, the BJP, won 116 seats (2004: 138 seats).

Ramani 2009). Many commentators believe, however, that one important factor for the UPA's election success was its focus on welfare policies and other government programs, and specifically NREGS (see e.g. Ramani 2009). INC's manifesto stressed NREGS as one of the main successes of the UPA government, and the party's slogan during the election campaign was *Aam aadmi ke badhte kadam, har kadam par bharat buland* (The common man moves forward, and with his every step India prospers). INC also bought the rights to the title song 'Jai Ho' (May there be victory) of the film Slumdog Millionaire, which tells the story of a boy from the slums who wins the Indian version of the quiz show 'Who Wants to Be a Millionaire'. This focus on the poor is widely believed to have resonated with the electorate, and INC leaders have also claimed that the electoral victory was in large part due to NREGS[13]. While such an election campaign strategy had been used repeatedly by INC in the past, experts stress that in contrast to previous campaigns which paid mere lip service to the party's commitment to the situation of the poor[14], the fact that NREGS was an actual ambitious government program made such claims credible.[15]

3 NREGS Rollout and Empirical Strategy

3.1 NREGS Rollout

NREGS was rolled out non-randomly in three phases between 2006 and 2008, with poor districts receiving the program earlier than more developed districts. While the exact algorithm used to determine the allocation of districts across NREGS phases is not in the public domain, institutional and contextual knowledge strongly suggest that the

[13]see for example Khera 2010

[14]Indira Gandhi's election campaign slogan for the general elections in 1971 was *Garibi Hatao* (Eradicate poverty), for example.

[15]see for example the comments on the election results by political science professors Thachil at casi.ssc.upenn.edu/iit/thachil and Kumbhar at www.mainstreamweekly.net/article1382.html

government used the same general strategy that it had used for the assignment of earlier, much less ambitious rural development programs: The assignment rules for earlier programs aimed at ensuring a careful balance of inter- and intra-state political fairness, and given the large amount of attention NREGS drew from policymakers, NGOs, researchers and the press as one of the government flagship programs, it seems very likely that the Indian government also followed political fairness norms in the assignment of NREGS districts. A number of NGOs and well-known individuals were actively campaigning for the introduction of an employment guarantee scheme like NREGS, and have been closely monitoring the working of the program since its introduction.[16] Neither the press nor politicians, NGOs and other experts complained about NREGS district allocations, which suggests that while there may have been some slippage in following a set algorithm, manipulation was not rampant. Given that the program was originally meant to be phased in much more slowly, receiving NREGS early should have been expected to create substantial benefits and should have encouraged complaints about unfair treatment.

The proposed algorithm has three provisions: First, each state receives at least one treatment district.[17] This means that government programs like NREGS operate even in the richest Indian states. Second, the number of districts allocated to a given state is proportional to the prevalence of poverty across states, which ensures that the number of treatment districts allocated to a given state is somewhat proportional to the percent of India's poor people living in that state.[18] Third, within a state districts are chosen

[16]Jean Dreze and Reetika Khera have been especially involved in NREGS from the beginning. Examples of monitoring include awareness campaigns for workers' rights under NREGS, survey data collection to find out about common challenges and violations of the law, suing governments for NREGA violations, and drawing attention to corruption. See e.g. Samarthan Centre for Development Support 2007.

[17]Union territories are typically excluded in these programs.

[18]The government term for this is 'incidence of poverty'. While there is no official definition of this term, it seems to be a combination of the poverty headcount ratio within a state (the percent of people living below the poverty line) and state population, since large states usually receive more districts than very poor but less populous states, although the mapping is not exact.

based on a development ranking by the Planning Commission of India, so that poor districts are chosen first.[19] Phase 1 allocation assignment for NREGS had an additional feature: In that phase, all districts on an existing list of districts majorly affected by left-wing terrorism received NREGS regardless of their rank. This means that in the within-state allocations, terrorist-affected districts were prioritized.[20]

The proposed algorithm for NREGS district assignment is therefore a two-step procedure where a number of eligible districts is allocated to states first, and districts within states are then chosen based on the Planning Commission ranking.[21]

Table 1 gives an overview of how well the proposed algorithm predicts NREGS receipt in the first and second phase for 17 major Indian states, since all remaining rural districts received the scheme in Phase 3.[22] Columns 1 and 3 provide the number of districts that a given state was assigned in Phase 1 and Phase 2, respectively, while the second and fourth columns show the number of districts in a given state that received NREGS although they should have been ineligible for the program based on the specified algorithm. As Table 1 shows, there is some slippage in NREGS district assignment since the algorithm cannot explain the treatment status of 22 of 183 districts that received NREGS in phase 1 and of 25 of 106 districts in Phase 2. Overall, the proposed algorithm

[19] See Planning Commission (2003).

[20] The terrorist-affected districts are taken from a list of districts that received the RSVY 32 program that was specifically targeting the development of districts heavily affected by left-wing terrorism, irrespective of their poverty level. For that program, districts had been identified by the Ministry of Home Affairs using criteria such as intensity of left-wing extremist violence, the presence of armed dalams, the spread of active front organizations of these groups, and the extent of proactive measures initiated by the police and administration.

[21] The all-India number of treatment districts in each phase, 200 and 130, do not seem to have been chosen to accommodate state or district demands for a certain number of treatment districts. 200 was the number of districts the Planning Commission suggested for an earlier development program which never really took off. The number 130, on the other hand, seems to have been adapted since a number of states that had received many NREGS districts in the first phase had only few untreated districts left that could be treated in Phase 2.

[22] Rank data is available for 447 of 618 districts in India. Data for the index creation was unavailable in some states. A former member of the Planning Commission says that in these states state governments may have had considerable say in district allocation, so in the absence of a general rule treatment status in these states is likely to be endogenous. I therefore exclude these states from my analysis.

works quite well for predicting Phase 1 and Phase 2 district allocations, however.[23]

3.2 Empirical Strategy

The algorithm allows the use of a regression discontinuity (RD) framework since it generates two state-specific cutoffs: the cutoff between Phase 1 and Phase 2, corresponding to Phase 1 treatment assignment, and the cutoff between Phase 2 and Phase 3, which is equivalent to the Phase 2 rollout of the program. Since the general elections took place in 2009 when all rural districts had access to the program, the phasing in of the program provides variation in the length of time districts had been implementing the scheme. Since treatment cutoffs differ by state, ranks are made state-specific for the empirical analysis.

As there is some slippage in district assignment, the empirical identification strategy is a fuzzy RD design. The fundamental assumption of the empirical strategy is that districts that were just poor enough to receive the program in a given phase of the NREGS rollout, and districts that were just too developed to be included in a given phase are similar to each other in terms of unobservable characteristics. Then, discontinuities in the outcome variables for these two types of districts can be solely attributed to the differences in the duration of having had access to NREGS.

While this assumption cannot be tested directly, the validity of the RD framework can be assessed through some tests. One important characteristic of a valid RD design is that districts must have imperfect control over their treatment status in a given phase. This implies that states and districts should not have been able to manipulate the index variable used to rank districts. Otherwise, districts close to the cutoff on either side are not plausibly similar to each other in terms of unobservables, but differ on characteristics such as the perceived benefit from the program.

[23]Some potential problems with the algorithm are discussed below.

That states or districts were able to manipulate the index variable values seems unlikely. First, the index variable was created from dated available information: The Planning Commission used data from the early to mid-1990s for the ranking of districts rather than collecting current information. This limits the possibility for districts or states to strategically misreport information. Second, the ranking had originally been used to target earlier development programs for especially poor districts, although with lower cutoffs of 100 and 150 districts, which implied lower state-specific cutoffs as well. So if districts were able to act strategically, the incentive would have been to be among the 150 poorest districts, but not among the 200 poorest districts used for NREGS in the first phase, and certainly not among the 330 poorest districts that received NREGS in either Phase 1 or Phase 2. Third, the creation of the index from the raw data by the Planning Commission is done in a very transparent way. The Planning Commission report outlines the exact procedure with which the index was created, and also lists the raw data for all districts, so that the composite index as well as the district ranking can be perfectly replicated. This implies that there was no room for manipulation at the level of the creation of the district rank variable.

Figures 1, 2 and 3 focus more closely on the distribution of index values over ranks. Ideally, the assignment variable should be continuous since discontinuities at the cutoffs are typically taken as signs of potential manipulation. Figure 1 graphs the relationship between the poverty index value and the assigned rank by the Planning Commission for all 447 districts for which data is available. It shows that the distribution of poverty index values is smooth and continuous across ranks. As the chosen cutoffs are state-specific, however, Figures 2 and 3 plot the relationship between the Planning Commission's index and the normalized state-specific ranks for the Phase 1 and Phase 2 cutoffs, respectively. For ease of comparison, the state-specific ranks in these figures have been normalized so that the cutoff for NREGS treatment in a given phase is at 0 in

all states, with the district with a state-specific rank of 0 being the last eligible district in a state. Negative numbers are assigned to districts with lower ranks than the cutoff rank, whereas positive numbers are assigned to the districts that are too developed to be eligible according to the district ranking in a given phase. As Figures 2 and 3 show, for most states the poverty index values seem pretty smooth at the cutoff of 0. Overall, these patterns suggest that manipulation of the underlying poverty index variable is not a big concern.

While the manipulation of the data used to create the district ranking seems unlikely, it is more difficult to rule out that the allocation of treatment districts across states was subject to political influence. While it is known which data source was usually used to estimate state-wide poverty measures, it is unknown which exact measure was taken as the 'incidence of poverty' that determines state allocations of treatment districts in government development programs. The current analysis takes the actual state allocations as the correct allocations. This implies that the true RD design could be fuzzier than the one used here if there was imperfect compliance with the state allocations, although again there is no evidence (such as complaints from NGOs or opposition parties) to suggest that this was an important concern.

With a fuzzy RD design, we also need to verify that there is indeed a discontinuity in the probability of receiving NREGS at the cutoff values for Phase 1 and Phase 2 NREGS districts. Figures 4 and 5 show this graphically for the normalized state-specific cutoffs for Phase 1 and Phase 2, respectively. They plot the probability of receiving NREGS in the given phase for each bin, as well as fitted quadratic regression curves and corresponding 95 percent confidence intervals on either side of the cutoff. The graphs show that the average probability of receiving NREGS jumps down significantly at both discontinuities, although the Phase 1 cutoff is fuzzier than the Phase 2 cutoff. Both figures suggest, however, that there is indeed a discontinuity in the probability of

being treated with the employment guarantee scheme in a given phase at the cutoff.

4 Data, Variable Creation and Empirical Specification

4.1 Data and Variable Creation

The election outcome data used in this paper are the official general election results of 2009 from the Election Commission of India.[24] For each electoral constituency, the Election Commission lists all candidates, their party affiliation, and the number of received votes per candidate as well as some limited candidate background information like gender, age, and broad caste category. It also gives the number of eligible voters in a given constituency, which allows the calculation of voter turnout.

Election constituencies are created to ensure fair votes-to-seat ratios that are roughly equal across the country, and therefore do not correspond perfectly to administrative boundaries in India. Since NREGS was rolled out at the district level, I match each election constituency to the closest appropriate district. The matching is done according to the name of the election constituency, which is usually a major city.[25] To this dataset, I merge information on the poverty index rank from the 2003 Planning Commission Report, information on the parties in power at the state level at the time of the 2009 general elections, district population size from the 2001 Census as well as information

[24]Data are publicly available at http://eci.nic.in. The Election Commission of India is an autonomous body that schedules and oversees elections.

[25]All electoral constituencies used in the empirical analysis can be matched non-ambiguously to one district. I use district boundaries from the 2001 Census to make these matches. The procedure of using the constituency name introduces some measurement error since election constituencies can span parts of more than one district, but this is uncommon. Furthermore, assigning such a constituency to the district that the constituency name's town is drawn from minimizes this measurement error since more local election results are not available. In most cases, there is one electoral constituency per district.

on a district's NREGS phase and some NREGS implementation quality information from the official government NREGS website.[26] This NREGS implementation quality information includes the number of individuals and households employed under NREGS in a given district, the number of households reaching the limit of 100 days, and the total person-days generated by NREGS. All these variables are for the financial year 2008-09, which is roughly the year before the general elections take place[27] and the only time span in which districts from all phases had access to NREGS. At the time of the general elections in April 2009, Phase 1 districts had had NREGS for three years, Phase 2 districts for two years, and Phase 3 districts for one year. As an alternative measure of implementation quality of NREGS I also create an indicator variable equal to 1 if a constituency belongs to what has been called a 'star state', and 0 otherwise. Field reports on the working of NREGS in Khera (2011) identify five states in which NREGS seems to be implemented better than in the rest of the country: Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Rajasthan, and Tamil Nadu.

I create various outcome variables to measure the impact NREGS had on the general election results. Since India has a first-past-the-post system, an important outcome is the number of constituencies in which a party received the plurality of the vote since this directly translates to won seats in the Lok Sabha. I therefore create index variables equal to 1 if a given party or alliance won a plurality of votes in a constituency, and 0 otherwise. I also create variables of the received vote share of parties and alliances in a constituency. The empirical analysis focuses on the UPA government coalition and its main party the INC as well as the INC's main national competitor, the BJP, and the Left Front. In an extension, I also look at voter turnout.

[26]The NREGS website is http://nrega.nic.in.
[27]The financial year starts on April 1.

4.2 Empirical Specification

India had 543 elecotral constituencies in the 2009 general elections, but corresponding district Planning Commission rank information needed for the implementation of the regression discontinuity design is only available for 470 of them.[28] These come from the 17 states listed in Table 1. As the number of observations near the cutoffs is therefore limited, I use parametric regressions to estimate the impact of NREGS empirically. To test the robustness of the estimates, all main result tables show the estimated coefficients for linear and quadratic regression curves in the running variable with and without constraining the slope of the curves to be the same on either side of the cutoffs.[29]

To maximize statistical power, I jointly estimate the two cutoffs that can be empirically identified. The running variable is the state-specific rank variable. I drop the terrorist-affected districts that received NREGS in the first phase, since these received the program regardless of their poverty level. The middle category of Phase 2 districts is taken as the reference group, so that the coefficients for Phase 1 and Phase 3 directly provide the estimated treatment effect at the two cutoffs. It is important to note that since the RD design depends on observations being close to the cutoff for identification it is impossible to compare Phase 1 and Phase 3 districts directly, since these will be far apart from each other by design.

The equation below gives the regression equation for the most flexible specification with a quadratic regression curve with the slope not constrained to be identical on both sides of the cutoffs:

$$y_{ij} = \beta_0 + \beta_1 rank_{ij} + \beta_2 rank_{ij}^2 + \beta_3 nrega1ij + \beta_4 nrega3ij + \beta_5 nrega1 * rank_{ij} +$$

[28] Rank information is missing for urban districts as well as for some small states, especially in the North-East.

[29] F-tests reject the null hypothesis that higher-order polynomials add important flexibility to the model. More flexible models also tend to be unstable in the second stage of the two-stage least squares estimation procedure, although the estimated coefficients are often qualitatively similar to the quadratic results. The quadratic flexible specification only statistically outperforms the linear flexible specification in some instances.

$$\beta_6 nrega3 * rank_{ij} + \beta_7 nrega1 * rank_{ij}^2 + \beta_8 nrega3 * rank_{ij}^2 + \eta_j + \epsilon_{ij}$$

where the subscripts refer to constituency i in district j. y is an outcome variable of interest, whereas *nrega1* is an indicator variable equal to 1 if a district received NREGS in Phase 1, and zero otherwise. *nrega3* is the corresponding indicator variable for Phase 3. Since we are dealing with a fuzzy RD rather than a sharp RD, these two variables are instrumented with predicted NREGS receipt based on the state-specific algorithm. *rank* is a district's rank based on the state-specific index, and η are state fixed effects. The coefficients of interest are β_3 and β_4. In all empirical specifications, standard errors are clustered at the district level.

The validity of the RD design does not depend on the availability of baseline information, although including such variables as controls can improve the precision of the estimates. Therefore, my main results to not include control variables other than state fixed effects. Since the electoral constituency boundaries were redrawn between the 2004 and 2009 general elections, and boundaries changed for 499 of the 543 constituencies, it is also impossible to include 2004 constituency election results as control vatriables.

In contrast to RD designs in other contexts, the main results in this paper cannot also be shown graphically. Since the discontinuities exploited here are state-specific, the cutoffs vary across the Indian states. With just one estimated cutoff, the underlying running variable could be normalized so that the cutoff occurs at the same normalized rank in each state. With two cutoffs that are estimated simultaneously this is impossible, however, since states are allocated different numbers of treatment districts. This implies that if state-specific ranks are normalized so that the cutoff for Phase 1 occurs at the same point in all states this still would not lead to Phase 2 cutoffs occuring at the same value.

4.3 Summary Statistics

Table 2 presents some summary statistics for the sample used for the empirical analysis separately by NREGS phase. As we can see, voter turnout in the 2009 general elections was about 61 percent in Phase 1 and Phase 2 constituencies, although a bit lower in Phase 3 constituencies. The probability of winning a seat is between 30 and 40 percent for INC and weakly increasing in the phase number. This pattern is more pronounced for all the parties belonging to the UPA taken together, where the probability of receiving a plurality of the vote is about 40 percent in Phase 1 constituencies, but about 49 percent in Phase 3 districts. By contrast, the pattern for the INC's main national competitor, the BJP, follows a U-shape, whereas the probability of winning decreases for the Left Front in later NREGS phases. The winning probability of the BJP is around 20 percent, whereas the Left Front's chances are much lower. The corresponding average vote shares for the parties and the UPA reveal that a higher average vote share is often not necessarily associated with a higher probability of winning a seat.

The last two rows provide an overview of the implementation quality of NREGS, giving the number of persons employed under the scheme in the financial year 2008-09 as well as the corresponding number of generated person-days. These data come from administrative sources, since nationally representative information from other sources for the same time span is unavailable. Research by Niehaus and Sukhtankar (2012a and 2012b) has shown that at least in the state Orissa administrative data vastly overstates actual employment because of corruption, although it less clear how big this problem is nationwide. This means that employment statistics in Table 2 should be taken with a grain of salt. They do suggest, however, that employment generation in Phase 3 districts in their first year of implementing the program is lagging significantly behind the areas that have had access to NREGS for a longer period.

5 Results

5.1 Main Results

Tables 3 to 5 focus on the impact of NREGS on the 2009 general election outcomes for the government coalition. In each table, panel A shows the results for the probability of winning a constituency, whereas panel B concentrates on the vote share. All estimated models include state fixed effects. They also report the F-statistic of the first stage of the two-stage least squares models for the two instrumented variables of interest. The reference category are electoral constituencies in Phase 2 NREGS districts.

Table 3 shows the results for the influence of NREGS on the United Progressive Alliance's election outcomes. The specifications in columns 1 and 3 of panel A suggest an inverse U-shaped pattern of the treatment effect, although the coefficients are typically not statistically significantly different from zero: Since the reference group are Phase 2 NREGS constituencies which had had access to the program for two years at the time of the general elections, the estimated coefficients of the cutoff discontinuities suggest that both having had NREGS a year longer (Phase 1) and a year shorter (Phase 3) are associated with economically significant negative effects of the probability of winning a constituency of 27 and 17 percentage points, respectively, relative to the reference group. This pattern is not robust across specifications however, since the coefficients in columns 2 and 4 are positive, although again statistically insignificant.

The results for the UPA vote share (measured in percent) is qualitatively similar to the results in panel A, suggesting for example that the government coalition's vote share in Phase 1 constituencies close to the cutoff was about 2.3 percentage points lower than the vote share in Phase 2 constituencies at the discontinuity. Again, however, the results are not statistically significantly different from 0.

Table 4 presents the analogous results for the main party of the UPA, the Indian

National Congress (INC), and shows that NREGS seems to have had a much stronger influence on INC's votes. Most estimated coefficients are negative, again suggesting an inverse U-shaped relationship between the duration of NREGS access and votes for the main government party. The absolute magnitude of the coefficients is again substantial, and the estimates in columns 1 and 3 are statistically significant at at least the 10 percent level, suggesting very different voting behaviors for citizens in constituencies close to the two cutoffs on either side. The corresponding results for the vote share are again qualitatively similar to those in panel A, but mostly statistically insignificant. The results in Table 4 therefore show that NREGS had a stronger influence on INC election outcomes than on that of the overall government coalition.

Table 5 looks at the heterogeneity of these impacts with respect to political influence. It interacts the two variables of interest with an indicator variable equal to 1 if a subset of the UPA government coalition was also in power at the state level at the time of the general elections. It shows that the inverse U-shaped pattern seems to be mostly concentrated in non-UPA-led states: The main effects are typically negative whereas the interaction effects are mostly positive. Being a Phase 1 constituency close to the cutoff in column 1 of panel A, for example, is associated with an about 25 percentage points lower probability of the UPA receiving a plurality of votes. If that constituency is in a state that has a UPA state government, however, this negative effect is reduced to about 14 percentage points. Being in an UPA state therefore seems to mute the inverse U-shaped pattern, or even reverse it. This result is also present for the UPA vote share outcome variable in panel B where the interaction effects for Phase 3 districts are especially large in absolute magnitude and often statistically significant at the 1 percent level.

Overall, the results so far provide some evidence for an inverse U-shaped relationship of NREGS access and voting for the government in the general election. Voters close to

the treatment discontinuities in early and late NREGS districts seem to be less likely to vote for the government coalition, and the government's probability of winning a seat in these constituencies is lower. This pattern is consistent with a story in which voters in areas that just recently started implementing NREGS initially face some information constraints about the program and its benefits so that citizens' approval for the government that introduced the scheme initially increases in the duration of NREGS. After having had the program for some time, however, people may realize the practical limitations and implementation issues with the scheme and be less enthusiastic about NREGS, leading to a drop in the votes for the government in constituencies that have had NREGS for a longer period.

The inverse U-shaped pattern is mostly driven by the voting behavior for INC, suggesting that voters attribute the main responsibility for NREGS to INC rather than the other coalition partners. Since INC was actively stressing NREGS as a major achievement of the government in its manifesto and election campaign, this is also consistent with the party's self-proclaimed focus on welfare policies and NREGS specifically. Table 5 underlines the potential importance of the visibility of NREGS as a major election campaign issue since the inverse U-shaped pattern is muted in UPA-governed states. With the exception of Tamil Nadu, all UPA-led state governments at the time were dominated by INC, which may have made NREGS especially prominent during the campaign. This seems to have paid off especially in Phase 3 contituencies, where the program had only been introduced recently and where the election campaigns could have substantially reduced information constraints about the program and its benefits.

5.2 Extensions

The main results suggest that the visibility of NREGS as a major election campaign issue by INC may have increased voters' likelihood to vote for the government parties.

Especially if information constraints in late NREGS areas and dissatisfaction with the scheme in early NREGS locations are potential factors explaining the inverse-U shaped pattern, we would expect a higher NREGS implementation quality to also counteract some of the negative election results relative to Phase 2 districts: NREGS is presumably more visible in districts that implement the scheme well right from the start, for example because rationing of projects is lower, employment higher, and corruption less widespread. This should reduce information constraints in such districts relative to areas where the scheme is less well-implemented. By the same token, continued satisfaction with NREGS should be higher in districts where the scheme works well, so we would expect a less pronounced drop-off of votes for the government in these Phase 1 districts.

Tables 6 and 7 present the results of a NREGS implementation quality heterogeneity analysis by using two different quality proxies. Table 6 interacts the coefficients of interest with a star-state indicator variable. Star states are identified as states that implement NREGS well based on field reports in Khera (2011), and therefore provide a qualitative measure of the NREGS implementation success that is independent from government reports. Table 7, on the other hand, uses administrative data on the number of people employed under NREGS in the district in 2008-09, which is a continuous and more detailed measure, but also potentially significantly affected by strategic misreporting.[30]

Table 6 provides some evidence that the inverse U-shaped pattern is indeed muted in states that implement NREGS better. Similar to Table 5 this is especially evident for Phase 3 districts and in panel B: The vote share for the UPA is about 18 percentage points higher in Phase 3 districts in star states in column 1 of panel B, for example, making the overall effect of NREGS on the UPA vote share positive in these

[30]The results for other implementation quality proxies available at the district level for that time span, such as the number of households completing 100 days of employment or the total person-days generated, are qualitatively very similar to the results using this measure and are therefore not reported here.

constituencies. The interaction effect is statistically significant at the 10 percent level.

The results in Table 7 are also consistent with implementation having a positive impact on the government election performance. The estimated interaction coefficient of Phase 3 and the number of individuals employed under NREGS is positive and statistically significant at at least the 5 percent level in all specifications, although the magnitude of the effect is much smaller than in Table 6. The Phase 1 interaction effects, on the other hand, are usually negative and statistically insignificant, and are again very small in absolute magnitude. Overall, however, the results in Tables 6 and 7 seem to strengthen a story that relies on information constraints in late NREGS areas, and to a lesser degree on the dissatisfaction of voters with NREGS implementation issues in early NREGS constituencies.

So far the empirical analysis has focused on the performance of the government parties. In order to analyze whether NREGS is an important factor for explaining the unexpectedly strong election results for the UPA, and Congress specifically, it is also important to look at the performance of their political competitors, however. Table 8 replicates the results from Table 5 for INC's main national competitor, the BJP.[31] The main effects usually mirror the correponding estimates from Table 5, since the BJP winning probabilities and vote shares tend to be higher in Phase 1 and Phase 3 constituencies than in the reference group, but they are mostly statistically insignificantly different from zero at conventional levels. There is also no real evidence for heterogenous effects according to the party in power at the state level. All of this suggests that NREGS did not directly influence the BJP's unexpectedly weak election performance.[32]

Tables 9 and 10 focus on the alliance of left-wing parties that make up the Left Front, which also underperformed in the general elections relative to pre-poll predic-

[31]The results corresponding to Table 4 can be found in the appendix.

[32]There is also no evidence for heterogenous effects on NREGS implementation quality, so these results are omitted.

tions. Table 9 suggests that voters see the Left Front and the UPA as substitutes in welfare policies: The estimated coefficients mostly mirror the corresponding UPA results in Table 5 and are both economically and statistically significant. The relationship between NREGS access duration and Left Front votes follows a U-shaped pattern. Support for the left-wing parties is especially strong in the Phase 1 constituencies close to the cutoff relative to similar constituencies from the reference group. Such electoral gains in early and late NREGS districts relative to Phase 2 constituencies are more than outweighed in UPA-governed states, however, with large effects in absolute magnitude. Table 10 shows a qualitatively very similar pattern for star states: The Left Front garners significantly less support in the states where NREGS seems to be implemented well, and this is especially true for Phase 1 constituencies. This suggests that one reason for the poor performance of the Left Front in the general elections is indeed attributable to NREGS, since the UPA managed to cut into the Left Front's vote share in areas where NREGS is implemented well or in UPA-led states where NREGS was probably a major issue during the election campaigns. This seems to have worked especially in early NREGS districts. The Left Front seems to profit from voters substituting away from INC and the UPA in areas where NREGS is less visible, however.

Lastly, Table 11 looks at voter turnout to see whether differences in the composition of voters across districts from different implementation phases may be responsible for the voting patterns. The results show little support for such a hypothesis: While the estimated coefficients are typically negative, they are relatively small in absolute magnitude and statistically insignificantly different from zero.

6 Conclusion

This paper has analyzed the impact of a major government anti-poverty program in India, NREGS, on the government's performance in the next general elections. Using a regression discontinuity framework, I find that the relationship between the duration of NREGS access and votes for the government parties follows an inverse U-shape. This pattern is mainly attributable to the biggest party in the government coalition, and is muted or even reversed in areas where NREGS is implemented well and where the government coalition parties are also in power at the state level. Voters seem to regard the government coalition and an alternative alliance of left-wing parties as substitutes in welfare policies, whereas NREGS does not significantly influence the performance of the government's biggest national competitor.

These results are consistent with a story in which support for the government parties is lower in late NREGS districts because of information constraints about the working and benefits of the program, whereas support in early NREGS locations decreases because voters start being dissatisfied with the implementation problems of the scheme. These effects can seemingly be muted through a higher visibility of the program in the election campaign and through a better implementation of NREGS.

Overall, the results show that there is an electoral benefit of implementing ambitious anti-poverty programs in India, which seems to come at least partly at the expense of left-wing parties traditionally seen to be committed to welfare policies. At the same time, however, the empirical analysis in this paper suggests that such electoral payoffs may be relatively short-lived if the government is not really committed to a high-quality implementation of such programs. While election campaigns can serve to inform people about existing government policies and remind them of the benfits of the schemes, such a strategy may not be successful with voters in the longer run. Many voters seem to care about the actual benefits government initiatives like NREGS provide, and not just

about a verbal commitment to the fight against poverty. This points to a deepening of democracy since voting behavior is not determined solely by patronage networks or mere lip service to major issues.

References

[1] Azam, Mehtabul. The Impact of Indian Job Guarantee Scheme on Labor Market Outcomes: Evidence from a Natural Experiment, IZA Discussion Paper No. 6548, May 2012.

[2] Berg, Erlend, Bhattacharyya, Sambit, Durgam, Rajasekhar, and Manjula Ramachandra. Can Rural Public Works Affect Agricultural Wages? Evidence from India. CSAE Working Paper WPS/2012-05, 2012.

[3] Besley, Timothy, Pande, Rohini, and Vijayendra Rao. Just Rewards? Local Politics and Public Resource Allocation in South India. *World Bank Economic Review*, 26(2): 191-216, 2012.

[4] Dey, Nikhil, Jean Dreze, and Reetika Khera. Employment Guarantee Act: A primer, 2006.

[5] Dunning, Thad and Janhavi Nilekani. Ethnic Quotas and Political Mobilization: Caste, Parties, and Distribution in Indian Village Councils. Mimeo, 2012.

[6] Dutta, Puja, Murgai, Rinku, Ravallion, Martin, and Dominique van de Walle. Does India's Employment Guarantee Scheme Guarantee Enployment? World bank Policy Research Working Paper 6003, March 2012.

[7] Economic and Political Weekly (EPW). Defeated But Still a Threat, *Economic and Political Weekly*, XLIV(24): p.6, 2009.

[8] Ferraz, Claudio and Frederico Finan. Electoral Accountability and Corruption: Evidence from the Audits of Local Governments. *American Economic Review*, 101: 1274-1311, 2011.

[9] Government of India. The National Rural Employment Guarantee Act, 2009. Available online at http://rural.nic.in/sites/downloads/programmes-schemes/rajaswa.pdf

[10] Imbert, Clement and John Papp. Government Hiring and Labor Market Equilibrium: Evidence from India's Employment Guarantee. Working Paper, 2012.

[11] Johnson, Doug. Can Workfare Serve as a Substitute for Weather Insurance? The Case of NREGA in Andhra Pradesh, Institute for Financial Management and Research, Centre for Micro Finance, Working Paper Series No.32, September 2009.

[12] Johnson, Doug. How Do Caste, Gender and Party Affiliation of Locally Elected Leaders Affect Implementation of NREGA?, Centre for Micro Finance, Working Paper Series No.33, September 2009.

[13] Khera, Reetika. Wages of Delay, *Frontline*, 27(10), 2010.

[14] Khera, Reeitka. *The Battle for Employment Guarantee*. Oxford University Press, 2011.

[15] Ministry of Rural Development, Department of Rural Development, Government of India. Mahatma Gandhi National Rural Employment Guarantee Act 2005 - Report to the People 2nd Feb 2006 - 2nd Feb 2010. 2010.

[16] Niehaus, Paul and Sandip Sukhtankar. The Marginal Rate of Corruption in Public Programs, mimeo, April 2012.

[17] Niehaus, Paul and Sandip Sukhtankar. Corruption Dynamics: The Golden Goose Effect, mimeo, March 2012.

[18] Planning Commission. Report of the task force: Identification of districts for wage and self employment programmes, 2003.

[19] Ramani, Srinivasan. A Decisive Mandate. *Economic and Political Weekly*, XLIV(21): pp.11-12, 2009.

[20] Samarthan Centre for Development Support. Status of NREGA Implementation: Grassroots Learning and Ways Forward - 1st Monitoring Report. 2007

[21] Times of India, United Progressive Alliance: Partners in governance, July 8, 2006.

[22] Yadav, Yogendra. Electoral Politics in the Time of Change. *Economic and Political Weekly*, 34(34/35): pp. 2393-2399, 1999.

[23] Zimmermann, Laura. Impacts of the Indian Employment Guarantee Scheme? A Regression Discontinuity Analysis. Mimeo, November 2012.

Table 1: Prediction Success of Algorithm for Major Indian States

	Phase 1		Phase 2	
	NREGS	non-pred	NREGS	non-pred
Andhra Pradesh	13	1	6	1
Assam	7	0	6	3
Bihar	23	1	15	0
Chhattisgarh	11	1	4	1
Gujarat	6	2	3	0
Haryana	2	2	1	0
Jharkhand	20	0	2	0
Karnataka	5	1	6	5
Kerala	2	1	2	0
Madhya Pradesh	18	4	13	5
Maharashtra	12	1	6	2
Orissa	19	1	5	0
Punjab	1	0	3	1
Rajasthan	6	1	6	4
Tamil Nadu	6	2	4	0
Uttar Pradesh	22	2	17	3
West Bengal	10	2	7	0
Total	183	22	106	25

Note: Columns 1 and 3 give the number of treatment districts allocated to a state in a given phase of NREGS rollout. Columns 2 and 4 give the number of districts in a given state and phase whose treatment status is incorrectly predicted by the proposed algorithm. The proposed algorithm states that the number of treatment districts a state is assigned in a given phase should be filled with the least developed districts according to the Indian Planning Commission's ranking of districts (Planning Commission 2003). In the first phase, districts on an existing official list of districts majorly affected by left-wing terrorism were prioritized regardless of their rank.

Table 2: Summary Statistics

	Phase 1	Phase 2	Phase 3
N	144	109	217
voter turnout	0.6067	0.6088	0.5826
INC win	0.3472	0.3486	0.3871
UPA win	0.3958	0.4037	0.4931
BJP win	0.2222	0.1927	0.2212
Left Front win	0.0347	0.0183	0.0046
INC vote share	26.99	25.38	29.33
UPA vote share	34.85	32.13	37.49
BJP vote share	17.90	18.04	21.53
Left Front share	3.04	1.91	1.27
NREGS employment	117258	122750	55532
NREGS persondays	2204217	2242544	1646894

Note: Vote shares given in percent.

INC (Indian National Congress), UPA (United Progressive Alliance), BJP (Bharatiya Janata Party)

UPA is the name of the government coalition. For the government elected in 2004, the UPA consisted of the following parties: Indian National Congress, Rashtriya Janata Dal, Dravida Munnetra Kazhagam, Nationalist Congress Party, Pattali Makkal Katchi, Telangana Rashtra Samithi, Jharkhand Mukti Morcha, Marumalarchi Dravida Munnetra Kazhagam, Lok Jan Shakti Party, Indian Union Muslim League, Jammu and Kashmir Peoples Democratic Party, Republican Party of India, All India Majlis-e-Ittehadul Muslimen, Kerala Congress

Left Front is an alliance of left-wing parties and includes the Communist Party of India (Marxist), the Communist Party of India, the Revolutionary Socialist Party, and the All India Forward Bloc

Table 3: The impact of NREGS on UPA's election performance

Panel A: Impact of NREGS on won constituencies by UPA

	(1)	(2)	(3)	(4)
NREGS Phase 1	-0.266**	0.0669	-0.223	0.300
	(0.127)	(0.237)	(0.162)	(0.444)
NREGS Phase 3	-0.173	0.106	-0.192	0.295
	(0.143)	(0.235)	(0.138)	(0.398)
R-squared	0.219	0.226	0.224	0.216
N	470	470	470	470
outcome mean	0.4426	0.4426	0.4426	0.4426
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by UPA

	(1)	(2)	(3)	(4)
NREGS Phase 1	-2.259	8.199	-1.607	33.76**
	(4.549)	(7.704)	(5.454)	(13.49)
NREGS Phase 3	-1.633	4.547	-1.915	14.13
	(4.481)	(7.159)	(4.414)	(12.35)
R-squared	0.411	0.395	0.413	0.251
N	470	470	470	470
outcome mean	35.44	35.44	35.44	35.44
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1

Vote shares are in percent.

Robust standard errors for clustering at district level in parenthesis. UPA stands for United Progressive Alliance and is the name of the government coalition. For the government elected in 2004, the UPA consisted of the following parties: Indian National Congress, Rashtriya Janata Dal, Dravida Munnetra Kazhagam, Nationalist Congress Party, Pattali Makkal Katchi, Telangana Rashtra Samithi, Jharkhand Mukti Morcha, Marumalarchi Dravida Munnetra Kazhagam, Lok Jan Shakti Party, Indian Union Muslim League, Jammu and Kashmir Peoples Democratic Party, Republican Party of India, All India Majlis-e-Ittehadul Muslimen, Kerala Congress

Table 4: The impact of NREGS on INC's election performance

Panel A: Impact of NREGS on won constituencies by INC

	(1)	(2)	(3)	(4)
NREGS Phase 1	-0.320**	-0.224	-0.355**	-0.0846
	(0.126)	(0.244)	(0.163)	(0.452)
NREGS Phase 3	-0.243*	-0.171	-0.227*	0.0968
	(0.140)	(0.243)	(0.137)	(0.401)
R-squared	0.199	0.201	0.193	0.206
N	470	470	470	470
outcome mean	0.3660	0.3660	0.3660	0.3660
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by INC

	(1)	(2)	(3)	(4)
NREGS Phase 1	-7.250	-8.864	-10.72*	5.660
	(4.643)	(8.685)	(5.986)	(14.00)
NREGS Phase 3	-5.845	-9.888	-4.340	1.978
	(4.727)	(8.391)	(4.772)	(12.23)
R-squared	0.410	0.372	0.391	0.333
N	470	470	470	470
outcome mean	27.70	27.70	27.70	27.70
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1

Vote shares are in percent.

Robust standard errors for clustering at district level in parenthesis. INC stands for Indian National Congress, the main national party of the government coalition UPA (United Progressive Alliance).

Table 5: The impact of NREGS on UPA's election performance in UPA-governed states

Panel A: Impact of NREGS on won constituencies by UPA

	(1)	(2)	(3)	(4)
NREGS Phase 1	-0.252*	0.0730	-0.290	1.030
	(0.152)	(0.354)	(0.205)	(2.442)
NREGS Phase 3	-0.378**	-0.0572	-0.377**	0.845
	(0.167)	(0.337)	(0.167)	(1.196)
NREGS Phase 1*UPA	0.115	0.00881	0.145	-1.352
	(0.279)	(0.375)	(0.300)	(6.453)
NREGS Phase 3*UPA	0.467*	-0.212	0.510*	-1.029
	(0.272)	(0.639)	(0.307)	(7.624)
R-squared	0.223	0.161	0.218	
N	470	470	470	470
outcome mean	0.4426	0.4426	0.4426	0.4426
F stat first stage Phase 1	88.26	111.06	104.73	119.89
F stat first stage Phase 3	150.05	146.44	147.23	188.83
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by UPA

	(1)	(2)	(3)	(4)
NREGS Phase 1	-3.526	1.255	-6.262	48.62
	(5.308)	(11.27)	(6.733)	(94.01)
NREGS Phase 3	-9.544**	-11.13	-9.496*	11.42
	(4.854)	(9.861)	(4.932)	(45.32)
NREGS Phase 1*UPA	11.14	13.71	13.28	-47.92
	(9.114)	(11.10)	(9.771)	(256.6)
NREGS Phase 3*UPA	21.44***	30.81**	24.48***	-43.13
	(7.780)	(15.70)	(8.793)	(299.5)
R-squared	0.424	0.396	0.413	
N	470	470	470	470
outcome mean	35.44	35.44	35.44	35.44
F stat first stage Phase 1	88.26	111.06	104.73	119.89
F stat first stage Phase 3	150.05	146.44	147.23	188.83
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1
Vote shares are in percent.

Robust standard errors for clustering at district level in parenthesis. UPA-governed states had an elected UPA state government at the time of the general elections. These include Andhra Pradesh, Assam, Haryana, Maharashtra, Rajasthan, and Tamil Nadu.

Table 6: The impact of NREGS on UPA's election performance in NREGS star states

Panel A: Impact of NREGS on won constituencies by UPA

	(1)	(2)	(3)	(4)
NREGS Phase 1	-0.294*	0.126	-0.271	1.505
	(0.163)	(0.392)	(0.219)	(4.928)
NREGS Phase 3	-0.223	0.0600	-0.227	0.931
	(0.153)	(0.327)	(0.148)	(2.915)
NREGS Phase 1*star	0.130	0.140	0.115	-1.889
	(0.262)	(0.371)	(0.286)	(6.286)
NREGS Phase 3*star	0.225	0.522	0.203	-2.589
	(0.278)	(0.574)	(0.315)	(7.878)
R-squared	0.216	0.204	0.219	
N	470	470	470	470
outcome mean	0.4426	0.4426	0.4426	0.4426
F stat first stage Phase 1	87.62	109.9	102.08	164.56
F stat first stage Phase 3	149.14	129.17	145.17	142.21
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by UPA

	(1)	(2)	(3)	(4)
NREGS Phase 1	-6.707	-1.580	-8.157	50.53
	(5.865)	(12.13)	(7.447)	(109.0)
NREGS Phase 3	-4.638	-5.018	-4.378	18.33
	(4.694)	(9.573)	(4.724)	(64.73)
NREGS Phase 1*star	16.42*	18.07	17.33*	-29.95
	(9.127)	(12.11)	(9.894)	(139.0)
NREGS Phase 3*star	17.56*	30.88*	18.88*	-11.23
	(9.145)	(18.67)	(10.21)	(171.6)
R-squared	0.386	0.359	0.377	
N	470	470	470	470
outcome mean	35.44	35.44	35.44	35.44
F stat first stage Phase 1	87.62	109.9	102.08	164.56
F stat first stage Phase 3	149.14	129.17	145.17	142.21
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1

Vote shares are in percent.

Robust standard errors for clustering at district level in parenthesis. NREGS star states are those that according to field reports in Khera (2011) have implemented NREGS well. These include Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Rajasthan, and Tamil Nadu.

Table 7: The impact of NREGS on UPA's election performance depending on implementation success

Panel A: Impact of NREGS on won constituencies by UPA

	(1)	(2)	(3)	(4)
NREGS Phase 1	0	0	0	0
	(0.0357)	(0.0303)	(0.0382)	(3.89e-05)
NREGS Phase 3	0.417***	0	0.400***	0
	(0.0788)	(0.0261)	(0.0744)	(0.000189)
NREGS Phase 1*person empl	-2.71e-07	-3.15e-07	-2.42e-07	2.66e-06***
	(5.53e-07)	(8.44e-07)	(5.41e-07)	(8.15e-07)
NREGS Phase 3*person empl	1.85e-06**	2.89e-06**	1.80e-06**	7.68e-06***
	(7.31e-07)	(1.31e-06)	(7.12e-07)	(2.74e-06)
R-squared	0.060	0.066	0.070	
N	454	454	454	454
outcome mean	0.3660	0.3660	0.3660	0.3660
F stat first stage Phase 1	87.62	109.9	102.08	164.56
F stat first stage Phase 3	149.14	129.17	145.17	142.21
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by UPA

	(1)	(2)	(3)	(4)
NREGS Phase 1	0	0	0	0
	(1.275)	(1.065)	(1.426)	(0.00197)
NREGS Phase 3	7.141**	0	7.162***	0
	(2.841)	(0.777)	(2.563)	(0.00962)
NREGS Phase 1*person empl	-1.41e-05	-1.80e-06	-1.61e-05	0.000138***
	(2.08e-05)	(2.64e-05)	(2.07e-05)	(4.00e-05)
NREGS Phase 3*person empl	7.48e-05***	9.27e-05**	7.21e-05***	0.000418***
	(2.33e-05)	(4.06e-05)	(2.26e-05)	(0.000140)
R-squared	0.224	0.204	0.225	
N	470	470	470	470
outcome mean	27.70	27.70	27.70	27.70
F stat first stage Phase 1	87.62	109.9	102.08	164.56
F stat first stage Phase 3	149.14	129.17	145.17	142.21
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: *** p<0.01, ** p<0.05, * p<0.1

Robust standard errors for clustering at district level in parenthesis.

Vote shares are in percent. person empl is a continuous variable that gives the district-level employment for individuals generated under NREGS in the financial year 2008-09. The data come from administrative information.

Table 8: The impact of NREGS on BJP's election performance in NREGS in UPA-governed states

Panel A: Impact of NREGS on won constituencies by BJP

	(1)	(2)	(3)	(4)
NREGS Phase 1	0.173*	-0.187	0.146	-0.810
	(0.0962)	(0.226)	(0.133)	(0.787)
NREGS Phase 3	0.102	-0.175	0.103	-0.471
	(0.110)	(0.228)	(0.109)	(0.500)
NREGS Phase 1*UPA	0.0105	0.414	0.0314	0.431
	(0.163)	(0.258)	(0.181)	(1.688)
NREGS Phase 3*UPA	0.00545	0.793*	0.0351	-0.0822
	(0.165)	(0.473)	(0.199)	(1.981)
R-squared	0.335	0.268	0.334	0.141
N	470	470	470	470
outcome mean	0.2149	0.2149	0.2149	0.2149
F stat first stage Phase 1	88.26	111.06	104.73	119.89
F stat first stage Phase 3	150.05	146.44	147.23	188.83
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by BJP

	(1)	(2)	(3)	(4)
NREGS Phase 1	5.925*	4.842	3.720	3.315
	(3.258)	(6.864)	(4.082)	(52.17)
NREGS Phase 3	0.834	-1.615	0.873	0.130
	(3.522)	(6.467)	(3.505)	(25.69)
NREGS Phase 1*UPA	-5.251	5.263	-3.523	-21.49
	(7.423)	(8.591)	(7.518)	(137.6)
NREGS Phase 3*UPA	-1.351	11.34	1.100	-35.58
	(7.214)	(15.62)	(7.639)	(161.4)
R-squared	0.601	0.574	0.604	
N	470	470	470	470
outcome mean	19.61	19.61	19.61	19.61
F stat first stage Phase 1	88.26	111.06	104.73	119.89
F stat first stage Phase 3	150.05	146.44	147.23	188.83
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1
Vote shares are in percent.

Robust standard errors for clustering at district level in parenthesis. BJP stands for Bharatiya Janata Party and is the main national competitor for the Indian National Congress. UPA-governed states had an elected UPA state government at the time of the general elections.

Table 9: The impact of NREGS on the Left Front's election performance in UPA-governed states

Panel A: Impact of NREGS on won constituencies by the Left Front

	(1)	(2)	(3)	(4)
NREGS Phase 1	0.121**	0.277**	0.122*	0.311
	(0.0567)	(0.131)	(0.0697)	(0.706)
NREGS Phase 3	0.0670	0.171*	0.0670	0.168
	(0.0462)	(0.0989)	(0.0461)	(0.324)
NREGS Phase 1*UPA	-0.224**	-0.294**	-0.224**	-0.718
	(0.103)	(0.122)	(0.105)	(1.924)
NREGS Phase 3*UPA	-0.180*	-0.281*	-0.181*	-0.603
	(0.0924)	(0.167)	(0.0953)	(2.203)
R-squared	0.063		0.062	
N	470	470	470	470
outcome mean	0.0170	0.0170	0.0170	0.0170
F stat first stage Phase 1	88.26	111.06	104.73	119.89
F stat first stage Phase 3	150.05	146.44	147.23	188.83
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by the Left Front

	(1)	(2)	(3)	(4)
NREGS Phase 1	3.226	13.05*	4.406	30.74
	(2.842)	(6.890)	(3.659)	(58.52)
NREGS Phase 3	3.965*	12.72**	3.944	22.76
	(2.406)	(5.660)	(2.407)	(27.28)
NREGS Phase 1*UPA	-4.154	-10.60*	-5.079	-50.79
	(4.652)	(6.205)	(4.970)	(158.5)
NREGS Phase 3*UPA	-6.643*	-20.35**	-7.955*	-59.54
	(3.823)	(8.375)	(4.256)	(183.9)
R-squared	0.134	0.053	0.127	
N	470	470	470	470
outcome mean	1.96	1.96	1.96	1.96
F stat first stage Phase 1	88.26	111.06	104.73	119.89
F stat first stage Phase 3	150.05	146.44	147.23	188.83
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1
Vote shares are in percent.

Robust standard errors for clustering at district level in parenthesis. The Left Front is an alliance of left parties, including the Communist Party of India (Marxist), the Communist Party of India, the Revolutionary Socialist Party, and the All India Forward Bloc. UPA-governed states had an elected UPA state government at the time of the general elections.

Table 10: The impact of NREGS on the Left Front's election performance in NREGS star states

Panel A: Impact of NREGS on won constituencies by the Left Front

	(1)	(2)	(3)	(4)
NREGS Phase 1	0.131**	0.279**	0.143*	0.211
	(0.0597)	(0.133)	(0.0761)	(0.252)
NREGS Phase 3	0.0609	0.164*	0.0588	0.107
	(0.0402)	(0.0906)	(0.0403)	(0.151)
NREGS Phase 1*star	-0.221**	-0.315**	-0.229**	-0.354
	(0.0976)	(0.132)	(0.104)	(0.292)
NREGS Phase 3*star	-0.194*	-0.306	-0.205*	-0.279
	(0.100)	(0.191)	(0.107)	(0.363)
R-squared	0.055		0.041	
N	470	470	470	470
outcome mean	0.0170	0.0170	0.0170	0.0170
F stat first stage Phase 1	87.62	109.9	102.08	164.56
F stat first stage Phase 3	149.14	129.17	145.17	142.21
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by the Left Front

	(1)	(2)	(3)	(4)
NREGS Phase 1	3.116	12.07*	4.149	25.84
	(2.964)	(6.913)	(3.954)	(36.56)
NREGS Phase 3	3.037	10.46**	2.852	19.17
	(2.082)	(5.051)	(2.066)	(22.03)
NREGS Phase 1*star	-2.669	-8.745	-3.319	-23.49
	(4.373)	(6.270)	(4.796)	(45.38)
NREGS Phase 3*star	-5.671	-17.53**	-6.614	-34.96
	(4.080)	(8.743)	(4.546)	(56.81)
R-squared	0.139	0.078	0.134	
N	470	470	470	470
outcome mean	1.96	1.96	1.96	1.96
F stat first stage Phase 1	87.62	109.9	102.08	164.56
F stat first stage Phase 3	149.14	129.17	145.17	142.21
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1
Vote shares are in percent.

Robust standard errors for clustering at district level in parenthesis. The Left Front is an alliance of left parties, including the Communist Party of India (Marxist), the Communist Party of India, the Revolutionary Socialist Party, and the All India Forward Bloc. NREGS star states are those that according to field reports in Khera (2011) have implemented NREGS well. These include Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Rajasthan, and Tamil Nadu.

Table 11: The impact of NREGS on voter turnout

	(1)	(2)	(3)	(4)
NREGS Phase 1	-0.00266	-0.0427	-0.0196	0.0886
	(0.0165)	(0.0343)	(0.0231)	(0.0627)
NREGS Phase 3	-0.0179	-0.0533	-0.0106	0.0659
	(0.0218)	(0.0379)	(0.0214)	(0.0614)
R-squared	0.793	0.794	0.795	0.732
N	470	470	470	470
outcome mean	0.5960	0.5960	0.5960	0.5960
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1
Robust standard errors for clustering at district level in parenthesis.

Figure 1: General Distribution of Index over Ranks

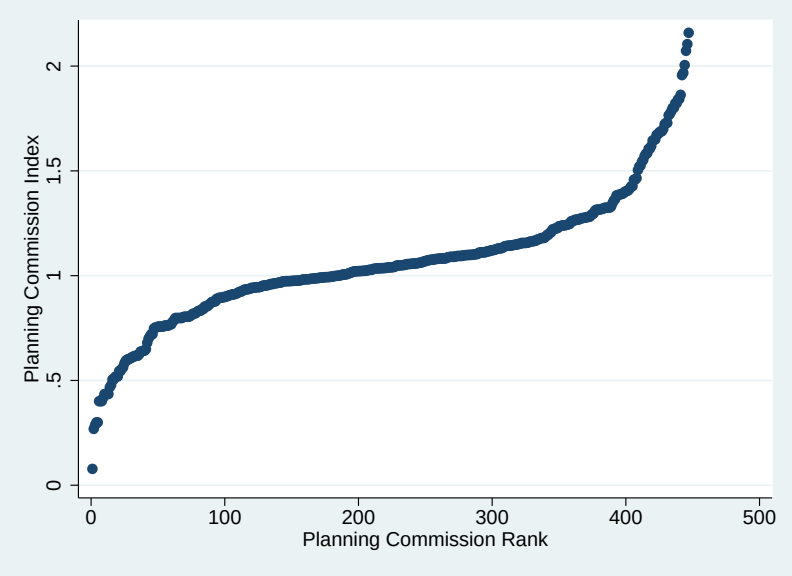


Figure 2: Distribution of Index over State-Specific Ranks (Phase 1 vs the Rest)

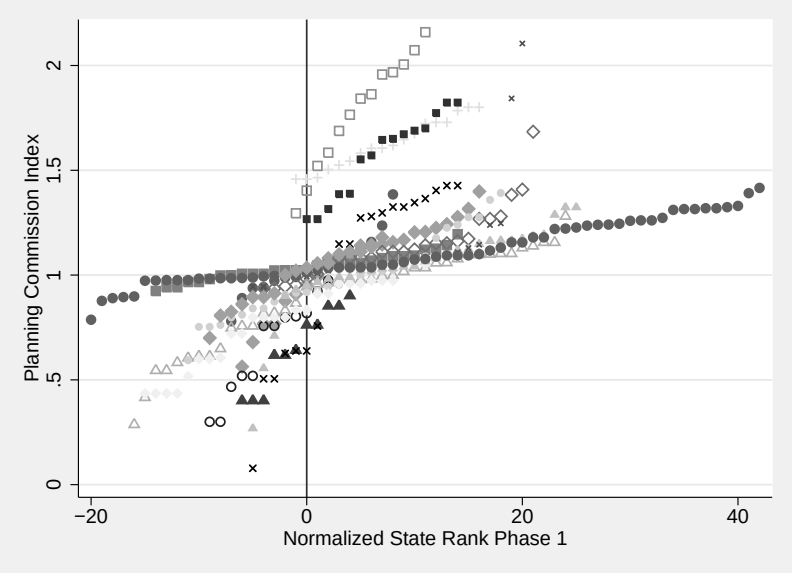


Figure 3: Distribution of Index over State-Specific Ranks (Phase 2 vs Phase 3)

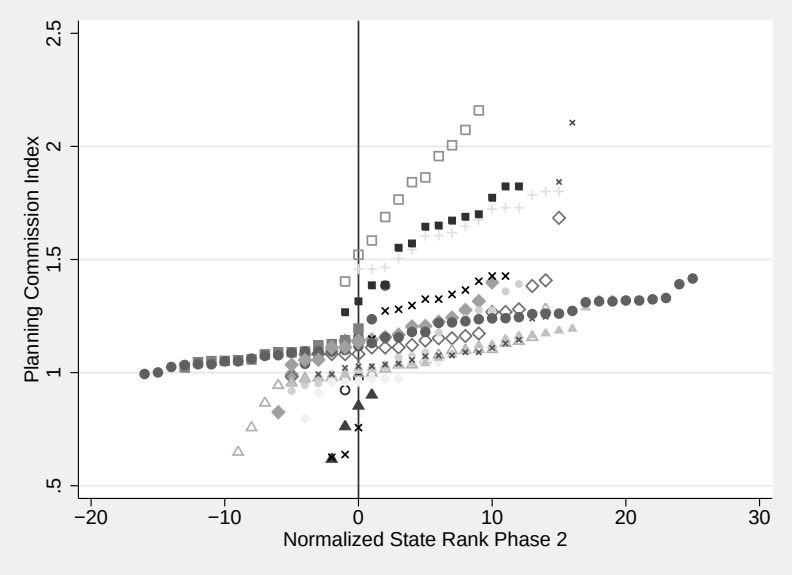


Figure 4: Discontinuity of treatment status for Phase 1

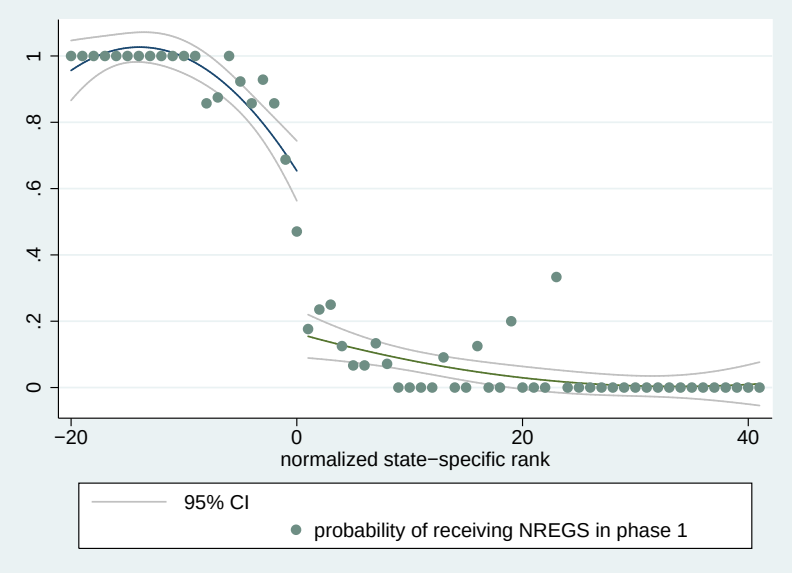
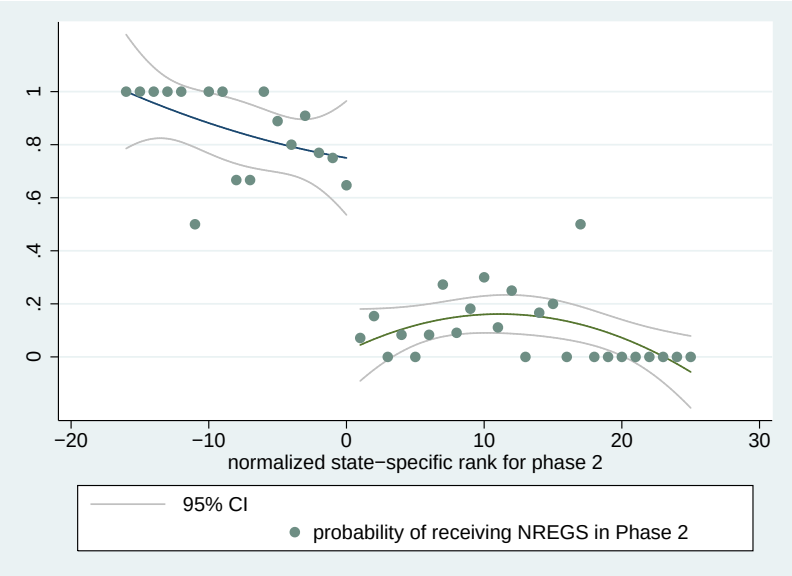


Figure 5: Discontinuity of treatment status for Phase 2



Note: Figure 10 excludes Phase 1 districts. The used bin size is 1, so each individual rank.

7 Appendix

Table A1: The impact of NREGS on BJP's election performance

Panel A: Impact of NREGS on won constituencies by BJP

	(1)	(2)	(3)	(4)
NREGS Phase 1	0.176**	-0.0514	0.156	-0.424
	(0.0777)	(0.148)	(0.104)	(0.301)
NREGS Phase 3	0.102	-0.0181	0.111	-0.0623
	(0.0975)	(0.163)	(0.0939)	(0.282)
R-squared	0.336	0.320	0.336	0.202
N	470	470	470	470
outcome mean	0.2149	0.2149	0.2149	0.2149
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by BJP

	(1)	(2)	(3)	(4)
NREGS Phase 1	4.371	2.799	3.008	-6.108
	(2.878)	(4.826)	(3.523)	(10.06)
NREGS Phase 3	1.482	0.252	2.073	-0.970
	(3.605)	(5.424)	(3.598)	(9.907)
R-squared	0.600	0.600	0.602	0.548
N	470	470	470	470
outcome mean	19.61	19.61	19.61	19.61
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1

Robust standard errors for clustering at district level in parenthesis. BJP stands for Bharatiya Janata Party and is the main national competitor for the Indian National Congress.

Table A2: The impact of NREGS on the Left Front's election performance

Panel A: Impact of NREGS on won constituencies by the Left Front

	(1)	(2)	(3)	(4)
NREGS Phase 1	0.0679	0.0911	0.0589	-0.0628
	(0.0478)	(0.103)	(0.0640)	(0.141)
NREGS Phase 3	0.0334	0.0414	0.0373	-0.0357
	(0.0402)	(0.0864)	(0.0380)	(0.100)
R-squared	0.085	0.091	0.091	0.011
N	470	470	470	470
outcome mean	0.0170	0.0170	0.0170	0.0170
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Panel B: Impact of NREGS on vote share by the Left Front

	(1)	(2)	(3)	(4)
NREGS Phase 1	2.605	6.752	2.723	8.150
	(2.302)	(4.758)	(3.069)	(6.719)
NREGS Phase 3	1.691	4.728	1.640	6.400
	(1.971)	(4.026)	(1.931)	(5.637)
R-squared	0.138	0.130	0.137	0.127
N	470	470	470	470
outcome mean	1.96	1.96	1.96	1.96
F stat first stage Phase 1	98.01	115.46	110.53	116.96
F stat first stage Phase 3	145.33	136.01	141.51	148.99
controls	No	No	No	No
state FE	Yes	Yes	Yes	Yes
polynomial order	1	1	2	2
flexible slope	No	Yes	No	Yes

Note: Note: *** p<0.01, ** p<0.05, * p<0.1

Robust standard errors for clustering at district level in parenthesis. The Left Front is an alliance of left parties, including.