

How Do Voters Respond to Welfare vis-a-vis Infrastructure Programs?

Evidence for Clientelism in West Bengal*

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Abstract

We study how voters respond to increased welfare and infrastructure program benefits delivered by local governments in West Bengal. Voters respond positively to welfare programs but not to infrastructure programs, while reporting having benefitted from both. Consistent with the voting patterns, shocks to electoral competition induced by exogenous redistricting of villages resulted in upper-tier governments manipulating allocations across local governments only for welfare programs. Through the lens of a hierarchical budgeting model, we argue these results indicate presence of political clientelism rather than programmatic politics.

JEL Classification: H40, H75, H76, O10, P48.

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1 Introduction

Political clientelism and vote-buying are commonly believed to undermine the functioning of democracy in many middle-and low-income countries.¹ While there are a number of different definitions of clientelism, the most common one involves elected officials or political parties trading delivery of government benefits by political incumbents to individual citizens in exchange for their political support (Hicken (2011)).² It can take the form either of ‘rewards’ to political supporters, or punishments (in the form of denial of benefits) to non-supporters. Such a system allows corrupt leaders to maintain successful political machines and perpetuate their grip on power by using their control over the benefit-targeting process. It may also motivate incumbent politicians to distort expenditure programs and under-provide benefits that are less effective instruments of clientelism. Khemani (2010), for instance, highlights an important ‘puzzle’ wherein public spending on infrastructure is low despite large demand from citizens for infrastructure services. The explanation she provides is that infrastructure projects are not well-suited for clientelism, compared to recurrent spending on salaries and welfare payments.

However it is hard to find rigorous evidence for clientelistic practices, as distinguished from program politics where private transfers cannot be selectively allocated by incumbents to households based on their political support. Direct evidence on the conditioning of benefits on political support is rare, as it tends to be informally expressed and based on implicit quid pro quo arrangements. This paper argues that the presence of clientelism can instead be indirectly inferred by studying how voters respond to private versus public benefits. Being non-excludable, public benefits cannot be used as a clientelistic instrument by political parties or candidates. When clientelism prevails, votes therefore respond only to private benefits, not to public benefits. In program politics involving two contestants, on the other hand, households vote sincerely based on their assessment that includes both private-and public-

¹See Stokes (2005); Kitschelt et al. (2007); Hicken (2011); Stokes et al. (2013) and Bardhan and Mookherjee (2018).

²In particular, this definition distinguishes clientelism from vote-buying involving (unconditional) pre-election gifts made by political candidates to voters in an effort to woo their votes.

good components of competing policy platforms.

We model hierarchical government decision-making that relates local government ‘budget’ allocations of different types of benefits to voter responsiveness of receiving these benefits. In West Bengal, as in most other states in India, the lowest tier of local governments is the *gram panchayat* (GP) and the next upper-tier is the *Panchayat Samiti* (PS). The GP is responsible for allocating various private benefit programs to villages and households within their jurisdiction, besides planning and administration of local infrastructure projects. The PS provides budgetary and technical approvals for these projects. This top-down hierarchical system provides considerable discretionary power to PS officials in project approvals and allocation of funds for different programs across GPs. This applies equally to welfare and infrastructure programs. It is important to note the contrast with developed countries such as the US where delivery of most private transfer programs (such as Social Security) are formula-bound rather than at the discretion of politically elected officials. It is precisely this institutional difference that potentially makes it easier for clientelism to operate in India.

Our approach necessitates data on different kinds of benefits received by households. We conducted a survey of households in rural West Bengal in 2011 in which heads of households reported various welfare and infrastructure programs they benefitted from over the preceding eight years. The welfare programs include different private benefits: workfare, subsidized loans, farm inputs, low-income housing, sanitation and food items. The infrastructure programs involved construction of local public goods: primarily roads, and also some irrigation and water programs. In addition to eliciting detailed information of benefits received, each of our household surveys ended with a post-election opinion poll, where the head of household marked his or her preferred choice on a “secret ballot” sheet containing the symbols of competing political parties. We show that the poll responses are positively correlated with actual vote shares of rival parties (aggregated at the corresponding constituency level for state assembly elections held the same year); suggesting that poll survey responses are a reasonable proxy for how households actually voted.³ The richness of data on receipt of different

³These are comparable to results for Sierra Leone in Casey (2015) who also uses poll survey responses as a proxy for votes.

types of benefits as well as on proxy voting behavior allows us test relative vote generating effectiveness of private versus public goods.

Our empirical analysis is carried out in two steps. In the first exercise, we examine the variation in local-government program scales resulting from changes in political competition. Following [Nath \(2015\)](#), we isolate exogenous variation in political competition by utilizing the redrawing of boundaries between state legislative-assembly constituencies implemented in 2007 (and announced in December 2006) by a politically neutral State Delimitation Commission composed of members of the national judiciary. The Indian Constitution imposes many restrictions on the process to ensure that redistricting cannot be manipulated by political parties to extract partisan benefits, which [Iyer and Reddy \(2013\)](#) verify using data from two other Indian states. We find similar evidence for West Bengal using our data.

The process by which budgets and approval for GP projects percolates down from upper tiers is not transparent; hence the model assumes that local residents credit the incumbent party at the GP when they receive benefits. Consequently it predicts that an exogenous increase in political competition will motivate politicians controlling upper-level governments to expand budgets to *aligned* lower-level governments that are controlled by the same party, and contract it for *non-aligned* GPs controlled by the opposing party.⁴ The hypothesis of clientelism-based distortions then translates into a prediction that only private benefit programs will be manipulated in this fashion. To test these predictions, a difference-in-differences (DID) approach is used to compare changes in GPs that were redistricted to more contested assembly constituencies (treatment) with corresponding changes in other GPs (constituting the control group).

We begin our analysis with two treatment groups which were both redistricted to more competitive constituencies and varied in alignment. We focus on 2004-2008 since alignment did not change over this period. To provide justification for the DID specification, we show that the different treatment groups and the control group did not differ significantly with respect to relevant village characteristics or variables reflecting possible motives for politi-

⁴See Figure 3.

cal manipulation (incumbency, representation in the Delimitation Commission or low caste reservation status). Moreover, we verify the absence of pre-2007 trend differences in private and public benefit distributions. Our results show that villages in the treated-nonaligned GPs experienced a 1.9-2.6 standard deviation (s.d.) smaller change in scale of private benefit programs compared to the control group, while the gap between the changes in the two treated groups grew by 2.9-3.6 s.d. (both significant at the 1% level). For public benefits, the corresponding differences were negligible (less than 0.2 s.d.) and statistically insignificant.

Next, we test the more demanding set of predictions of the theory concerning effects of redistricting to different combinations of competition changes and alignment. As shown in Figure 3, the theory predicts that the effects of GPs redistricted into less competitive (LCR) constituencies will be exactly the opposite of those redistricted into more competitive constituencies (HCR). Moreover, aligned villages redistricted to more competitive constituencies will be allocated larger program scales compared with those redistricted to less competitive ones, while the opposite will be true for non-aligned villages. Both these predictions turn out to hold for private benefits, while effects on public benefits continue to be negligible and insignificant for all treatment groups. We check robustness of these results to alternative definitions and measures of benefits, and conduct placebo tests validating the underlying identification assumptions.

Our second empirical exercise examines how political support at the household level was related to private and public benefits they received. An OLS regression of household support for the GP incumbent party in the 2011 survey shows that one standard deviation increase in private benefits during the previous three years was associated with a 2.4% higher likelihood of supporting the incumbent party at the GP level, significant at the 5% level. On the other hand, reported household benefits (standardized) from a local road program in those years was associated with a statistically insignificant 0.9% decrease in support.

The OLS results are subject to possible reverse causality resulting from unobserved heterogeneity both within and across villages. For example, anticipated voting patterns can affect the allocation of benefits as incumbents could target loyal supporters (generating a positive

bias), or they could target swing voters (generating a negative bias). To correct for such biases, we provide IV estimates using a ‘supply-side’ instrument for the scale of programs at the GP level: the average program scale in other villages in the same district, in the spirit of [Levitt and Snyder Jr \(1997\)](#). We interact these with fixed household characteristics such as caste, landlessness, education, and religion (significant determinants of within-GP targeting) to predict the delivery of benefits to individual households. We include district fixed effects in the regression, to remove biases owing to possible unobserved heterogeneity across districts.

The resulting IV estimate of effect of private benefits on household support for the incumbent turns out to be substantially larger than the OLS effect, amounting to a 14% higher likelihood of support for one standard deviation increase in benefit (p value less than .01). The corresponding IV estimate of the voting effect of a road benefit is negative and statistically insignificant. Hence the results at the household level mirror the patterns of manipulation of program scales at the GP level, in line with the predictions of the clientelistic model.

The rest of the paper is organized as follows. Section 2 describes the related literature, while Section 3 describes the institutional context and data used. Section 4 presents the theoretical model. Section 5 presents the empirical results for the GP benefit scale and effects on household votes; and Section 6 concludes.

2 Related Literature

There is a large literature on the political manipulation of allocations by upper-level government officials. One set of papers provides evidence of the ethnic favoritism or home bias of elected officials ([Burgess et al. \(2015\)](#), [Hodler and Raschky \(2014\)](#), [Hoffmann et al. \(2017\)](#)). Another set provides evidence of the role of political (rather than personal) motives of upper-level officials for various countries in Europe and North and South America ([Solé-Ollé and Sorribas-Navarro \(2008\)](#), [Brollo and Nannicini \(2012\)](#), [Finan and Mazzocco \(2016\)](#), [Levitt and Poterba \(1999\)](#), [Stashko \(2018\)](#)). These papers show the effects of political competition and the re-election concerns of higher-level officials on the allocation of

funds for local infrastructure. None of these papers provide evidence concerning the manipulation of private-benefit programs, possibly because most private transfers are programmatic rather than discretionary in these countries. Our main focus instead is testing for clientelism by comparing manipulation of private and public benefit programs, in the context of a low income country.

Another set of papers examine the effects of specific private benefit programs on voter behavior and political attitudes in various middle and low income countries (De La O (2013); Labonne (2013); Manacorda et al. (2011); Pop-Eleches et al. (2012)). Brollo et al. (2017) study the voting effects of local government officials' discretionary enforcement of conditionality provisions in a CCT program in Brazil. In the Indian context, a number of authors have explored the manipulation of funds by state and district officials for electoral advantage under the MGNREGA⁵ (Dey and Sen (2016), Gupta and Mukhopadhyay (2016)). While our findings regarding private benefit programs are similar, our main contribution is in testing for clientelism by comparing effects *across* private and public benefits.⁶

The only paper we are aware of that compares voter responsiveness to welfare and infrastructure programs is Levitt and Snyder Jr (1997), in the context of the US. They provide an IV estimate of US federal spending on votes in House districts, using as an instrument the level of spending in all other districts in the same state. We use a similar instrument in our household-level analysis and, like them, find a large discrepancy between OLS and IV effects. They find a \$100 increase in per capita spending on 'high variation programs' (including local infrastructure) resulted in a 2% increase in votes for the incumbent, while spending on 'low variation' programs (consisting of private transfer programs involving direct payments to citizens) resulted in a 0.2% reduction. In terms of disparate effects of private transfers and local

⁵MGNREGA: Mahatma Gandhi National Rural Employment Gurantee Act

⁶In this respect, our work is closer to that of Wantchekon (2003) for Benin, who found presidential candidates' campaign promises of private transfers generated higher voting responses than promises of local public goods. However, his results are consistent with program politics if voters derive relatively low marginal utility from public goods. In that sense it is not a test for clientelism relative to program politics. In our context, we have independent confirmation from household surveys that they valued road projects. Despite constituting the second-largest source of benefits reported, road programs failed to generate political support for the incumbent the way that private benefit programs did.

infrastructure on household votes, this is exactly the opposite of what we find. The discrepancy owes presumably to a different institutional setting in the US wherein private transfers are programmatic, while elected politicians exercise discretion over the inter-jurisdictional allocation of infrastructure funds. In the West Bengal context, both private and public benefit programs are discretionary and ‘high variation’, thereby permitting clientelistic practices.

This paper is also related to an emerging empirical literature in political economy that examines the role of political competition in provision of public goods vis-a-vis social programs. Using cross-country data, [Keefer and Knack \(2007\)](#) show that fraction of government spending in public investment is higher in countries with no competitive elections. [Khemani \(2010\)](#) uses panel data on state budgets in India to show that share of capital spending declines (and share of social programs increases) when there is greater voter participation (a proxy for higher re-election concerns). She argues that private goods are conducive for vote-buying while public goods are more suitable for rent seeking; so, in absence of electoral pressures, elected leaders are more likely to increase the share of capital spending. In contrast to these papers that (given an implicit single "aggregate" budget constraint) examine the substitution patterns between public goods and private transfers, we use a model of hierarchical government with a separate budget constraint for each type of good - private and public - to examine how they are allocated across local governments. While this exercise allows us to provide direct evidence for clientelism, it does not allow us to make inferences about potential under-provision of public goods as a *consequence* of clientelism.

Finally, some authors have studied the effects of dismantling clientelistic programs and the rise of formula-bound transfers in Latin American countries, a question different from but nevertheless broadly related to the one we analyze ([De Janvry et al. \(2014\)](#); [Dower and Pfutze \(2015\)](#); [Fried \(2012\)](#); [Frey \(2019\)](#)).

3 Context and Data

Political Environment and Government Hierarchy. During the period of our study (2003-2011), there were two principal political parties competing in West Bengal: the Left Front (LF) coalition led by the Communist Party of India (Marxist) and the All India Trinamool Congress (TMC). The Left Front dominated elected offices corresponding to village, district, and state governments from 1977 to 2011 and lost its majority in the state assembly to the TMC in 2011. In the constituencies included in our sample, between the 2006 and 2011 state assembly elections, the Left Front's vote share dropped from 50% to 41% while the TMC's share rose from 24% to 35% (see Table 1). Figure 4 shows how Left Front dominance progressively gave way to TMC dominance across successive elections in 2006, 2009 and 2011 at the assembly, parliamentary and assembly levels respectively. Hence the period we study was marked by intense political competition between these two parties.

India is a federal state with legislative, administrative, and executive powers divided between the central and state governments. Each state has a hierarchy of administrative governments and elected bodies. A large range of benefit programs are administered, with upper-level governments raising the funds to pay for them and devolving spending authority to lower level governments. Program budgets flow down the hierarchy. District-level governments, *zilla parishads* (ZPs), allocate funds to middle-tier governments at the 'block' level, which comprise an elected body *panchayat samiti* (PS) and appointed bureaucrats in the Block Development Offices. The middle tier then allocates funds to bottom-tier *gram panchayats* (GPs) within their block. Finally, the elected GP bodies distribute benefits across and within villages in their jurisdiction. Unlike the US where allocation of public goods across local governments is discretionary and private benefits are based on strict eligibility criteria, both local public goods allocation and private benefits are discretionary in India.

Our analysis will focus on the bottom two tiers: the PS at the block level, and the GP at the village level (see Figure 1). There are approximately 20 PSs in each district; each PS oversees roughly 10 GPs, and each GP allocates benefits among 10-15 villages each. Each village in turn includes about 200-400 households. Council members and their chairpersons

(Pradhans) are directly elected in each PS and GP. The area covered by a PS coincides or overlaps to a high degree with a state-assembly constituency, which elects a member of the Legislative Assembly (MLA) every five years. During the period 2003-2011, state assembly elections were held in 2006 and 2011, and local government (PS,GP) elections in 2003 and 2008. Elections to the national Parliament were held in 2009. All elections are first-past-the post. Incumbency at the PS and MLA levels are positively correlated; for 70% of GPs in our sample the corresponding MLA was from the same party that controlled the PS. And as Figure 1 shows, political control at the PS tends to be positively correlated with political control at the GP level, but this correlation is not perfect. This results in variations in alignment of political control between the two tiers.

Survey Data. We obtain information on benefits received by households and a proxy measure of their voting behavior from a household survey carried out in 2011. The households in the sample are the same set of households that were surveyed by Bardhan et al. (2014) in 2004. The sample was randomly selected (stratified by landownership) from 89 villages in 59 GPs spread through all districts of West Bengal, excluding Kolkata and Darjeeling. Approximately 25 households were surveyed in each village. Table 2 provides a summary of the demographic characteristics for the 2,402 households.

We construct political support data from poll responses of heads of household. The straw polls simulated the "secret ballot" voting process. The households were shown sample ballots and ensured that names of the respondents would not appear. The respondents were given the ballot and a locked box. They were allowed to go into a separate room, cast their vote by putting their ballots in the locked box and then return the box to the interviewer. The survey was conducted shortly after assembly elections in 2011. We compared the straw poll results of 2011, and the earlier straw polls conducted in 2004, to official voting outcomes at the Assembly Constituency level over this period. As seen in Table 1, vote shares in our post-election poll shifted in favor of the TMC in a similar way, though larger in magnitude than the observed shift in actual vote share. This difference in magnitude is not surprising, since the sample (third and fourth columns in Table 1) covers a small fraction of the population

voting in the corresponding electoral constituencies (represented in the first two columns).⁷

One concern with using post-election survey polls is that voters may systematically misrepresent their voting choices. To check its reliability, we compare the share of votes for the Left Front from the survey data with the official Election Commission data for assembly elections. The vote shares for the Left Front from the post-election survey polls are aggregated at the assembly-constituency level. We pool the two rounds of survey data and two assembly-election results in 2006 and 2011. Figure 6 plots vote share aggregated from survey data against the corresponding actual shares in the assembly elections. The correlation is 0.57 and significant at the 1% level. Since data on actual votes at the individual level is not available, we will use the poll responses of household heads as a proxy for how they actually voted.

We now describe the major benefit programs. Some were sponsored by the central government, with the bulk of funds provided by the central government, and the remainder by the state government. These programs were supplemented by various benefit programs funded mainly by state and local funds. Administrative data on the programs we study does not provide the level of disaggregation that we need. Moreover, there are concerns about reliability of administrative data for these programs (Niehaus and Sukhtankar (2013)). In order to obtain information on benefits at the household level, we surveyed heads of households and ask them to report the major benefits they received from the local governments.

Many of the programs listed in our survey created benefits that were clearly private (i.e., household-specific) in nature. These include (a) *employment* in programs such as Jawahar Rozgar Yojana, MGNREGA and MPLADS; (b) *minikits* providing farmers with seeds and fertilizers at highly subsidized rates; (c) subsidized credit; (d) *house or toilet* - lumpsum transfer to households for house or toilet construction; and (e) *Below Poverty Line (BPL)* cards, which identify poor households and entitle them to subsidized food grains and other household items. Public benefits in our data comprise construction of roads and irrigation. Some programs like drinking water could be classified as either private or public, since some taps may be installed in areas where many households may be able to access it. We classify

⁷The state legislative assembly consists of approximately 200 rural constituencies, with a constituency corresponding roughly to 50,000 households. Our sample only has 2400 households across all rural constituencies.

them as private and check robustness of our results with an alternative definition of public goods that includes drinking water taps. For more details on these individual programs, see the online appendix.

The first two columns of Table 3 provide the average proportion of village households who reported receiving (at least one) benefit from different programs over the periods 2004-06 and 2007-08. Among private benefits, employment programs recorded the largest number of beneficiaries. In 2004-06, road programs recorded the next largest number of beneficiaries. The flow of beneficiaries from road programs however fell after 2007, unlike private benefit programs such as employment, minikits, BPL cards or low income housing and sanitation which were maintained at roughly the same level as before. The last column shows the benefits reported between 2009-11, after a new set of local government officials were elected in 2008. We shall use this period to study the relation between household level votes and benefits they received.

Redistricting. To isolate exogenous variations in political competition at the GP/village level, we utilize information about redistricting of assembly constituencies that caused some GPs to be moved to a different constituency in 2007. Electoral constituency boundaries for parliamentary and state elections are periodically redrawn in order to equalize the population sizes of constituencies. This was the case in all Indian states following the 2001 census, when redistricting took place based on changes in census population figures between 1981 and 2001. The previous redistricting took place three decades earlier. The Election Commission of India set up a three member Delimitation Commission for each state, comprising a retired chief justice, a member of the Election Commission of India, and the state election commissioner. An advisory committee consisting of five MPs and five state-assembly representatives representing different political parties provided input into the process. The state redistricting commission follows transparency and fairness rules concerning the redistricting process, including holding public hearings and addressing complaints. The new boundaries went into effect in West Bengal in late 2006. We therefore treat 2003-2006 as pre-redistricting years and 2007-2011 as post-redistricting years. [Iyer and Reddy \(2013\)](#) studied redistricting

in two other states and found no evidence of violation of the mandated rules. They also found that the outcomes were politically neutral, with few exceptions (which arose with regard to redrawing the boundaries of constituencies of incumbents on the advisory committee).

In our sample, 26 out of 89 villages were redistricted. The bottom layer of Figure 1 gives the breakdown of redistricted villages in our sample across jurisdictions classified by political control of the PSs and GPs (in the 2003 panchayat elections) and whether the redistricting was to a more or less competitive constituency (i.e. with a smaller difference in vote shares between the winner and runner-up in the 2006 Assembly election). Of the villages that were redistricted, 13 were ‘moved’ to a more competitive constituency and 13 were ‘moved’ to a less competitive constituency. Figure 5 shows the pattern of changes in competitiveness generated by redistricting in our sample. The horizontal axis represents the victory margin (difference in vote share between the winner and runner-up in the 2006 Assembly elections) in the original constituency to which a GP/village was assigned prior to 2007, while the vertical axis represents the victory margin in the newly defined constituency following 2007. Non-redistricted GPs are represented by the green dots, lying along the 45 degree line since they were assigned to the same constituency. HCR GPs are denoted by blue dots which all lie below the line of equality, and LCR GPs by the brown dots lying above.

In our subsequent analysis, we partition redistricted villages into different ‘treatment’ groups depending on alignment and change in competitiveness, and test predictions of the theoretical model concerning differences in benefit flows between them and relative to the residual control group.

4 Model

Elections take place at the end of every period $t = 1, 2, \dots$. In what follows, we focus on resource-allocation decisions made at date t by incumbents (officials elected at the end of date $t - 1$) at each level of government, which are followed by elections at the end of date t to select officials in power at date $t + 1$.

We focus on two tiers in the local government hierarchy: the higher tier is a block managed by a PS which corresponds to an assembly constituency in the elections. A representative constituency $C_i, i = 1, 2, \dots$ has a jurisdiction consisting of GPs that distribute benefits in villages $v \in C_i$. To simplify the exposition, we assume the jurisdiction of a GP consists of a single village. Let n_v denote the share of village v in the population of C_i .

At each date t , elections are held at constituency and GP levels. Two political parties L and T compete in both these elections. In period t , constituency C_i is controlled by either the L party ($I_i = 1$) or the T party ($I_i = -1$) as a result of the outcome of the election at the end of $(t - 1)$. Elected officials follow the mandate of the incumbent party in allocating budgets for various programs to GPs. At t , village v has a GP that is controlled by either the L party ($I_v = 1$) or the T party ($I_v = -1$). Let η_i denote $\sum_{v' \in C_i} n_{v'} I_{v'}$, which is positive (resp. negative) if the L (resp. T) party has above-average control of the villages in the constituency.

Households within any village belong to different socio-economic groups $g = 1, \dots, G$. The demographic share of group g in village v is denoted by μ_{vg} . Members of each group have identical preferences for benefits. There are K different benefit programs; some deliver public (non-excludable) goods, while others distribute private goods. Benefits are indivisible: each resident receives either one unit or none. Receipt of benefit k generates a utility of β_{kg} for a member of g . Budgeting is top-down: for each program k , in period t , the GP is assigned a budget or per capita program scale of B_{kv} units by the upper tier constituency C_i . If the benefit is a public good, every resident receives the same number of units (B_{kv}).

While private benefits could be recurring or one-time, we will initially ignore this distinction; assume for now that all private benefits are recurring and randomly distributed via lottery within socio-economic groups.⁸ The decision made by the GP then reduces to allocating the assigned budget across different groups. This is represented by π_{kg} , the fraction of each group g that receives benefit k .

Let \mathcal{P}, \mathcal{R} denote the set of public and private benefits, respectively. In period t , the incum-

⁸A household's entitlement and demand for a recurring benefit (such as employment or a loan) is the same at all dates, irrespective of receipts of the benefit at previous dates. Hence every household is potentially eligible to receive a recurring benefit. For a one time benefit (such as low income housing, or BPL cards), a household that has already received one in the past is not entitled to another unit in the future.

bent party $p = L, T$ controlling the GP selects a policy π_{kg}^p , the fraction of group g residents that will receive benefit $k = 1, \dots, K$, satisfying the feasibility conditions $\pi_{kg}^p = B_{kv}$ for all $k \in \mathcal{P}$, and $\sum_g \mu_{vg} \pi_{kg}^p = B_{kv}$ for each $k \in \mathcal{R}$.

Given an allocated program budget $B_{ki}, k = 1, \dots, K$ from the district government at the third tier, the party controlling constituency C_i selects an allocation B_{kv} across villages in its jurisdiction, satisfying the budget constraint $\sum_{v \in C_i} n_v B_{kv} = B_{ki}, k = 1, \dots, K$. We take as given the budgetary allocation across constituencies. A previous version of this paper showed that the analysis of the two-tier model could be extended to three tiers (i.e., endogenizing constituency allocations received from district-level governments) while generating similar results. So we focus on the simpler two-tier model here.

As mentioned previously, budgeting is top-down: in the first stage of the game, the party controlling each constituency receives a budget from the district and allocates it among different GPs in its jurisdiction. This allocation determines the distribution of public benefits across villages. For private goods, at the second stage of the budgeting game, each GP allocates the assigned budget among different socio-economic groups within the village.

Finally, at the end of t elections are held at both GP and constituency levels. Households in each village cast a vote for either party in elections at both levels, where they anticipate the incumbent to repeat the same policy if re-elected. Their expectations about the future policy of the opposing party is a discounted version of that party's electoral platform, as explained further below. Below, we describe alternative specifications of these electoral contests, which corresponds to program politics and clientelism. In both versions, elected officials at either tier seek to maximize the probability of their party's victory in the next election.

We study sub-game perfect Nash equilibria of the three-stage game. This approach requires us to work backward, starting with voting at the third stage.

4.1 Voting under Program Politics

First consider a standard model of “program politics” without clientelism (Dixit and Londregan (1995), Grossman and Helpman (1996)). Voting is retrospective: for the incumbent

party, the current distribution pattern π_{kg} is what voters expect in period $t + 1$ if it were to be re-elected. For its opponent, it is the electoral platform discounted by a “credibility” parameter $(1 - \alpha)$ smaller than one, thus generating an electoral advantage for the current incumbent. This is because the platform of the challenger consists of a promise, which is compared by voters with what the incumbent is currently providing. Specifically, with probability α , households expect zero benefits from the challenger if elected in the next period.

Households vote partly on the basis of the utility of the benefits they expect, and partly on the basis of the loyalty they feel toward each party (based on historical attachment, identity, or candidate personality). Suppose L is the incumbent in the GP. Relative loyalty $\tilde{\theta}$ to the L party is uniformly distributed within group g in village v with constant “swing” density $\frac{1}{s_{vg}}$ and mean θ_{vg} , where $s_{vg} > 0$ is small enough to ensure interior solutions for vote shares. A member of group g with L-loyalty $\tilde{\theta}$ will vote for L if

$$\tilde{\theta} + \sum_k \beta_{kg} \pi_{kg}^L > (1 - \alpha) \sum_k \beta_{kg} \pi_{kg}^T \quad (1)$$

In the period t election, the L party’s resulting vote share among village v residents will be

$$\sigma_v^p = \bar{\theta}_v + \sum_g \mu_{vg} s_{vg} \sum_k \beta_{kg} \pi_{kg}^L - (1 - \alpha) \sum_g \mu_{vg} s_{vg} \sum_k \beta_{kg} \pi_{kg}^T \quad (2)$$

where $\bar{\theta}_v \equiv \frac{1}{2} + \sum_g \mu_{vg} \theta_{vg}$ represents the mean popularity of party L in village v .

4.2 Voting under Clientelism

Now consider the implications of clientelism, based on the formulation in [Bardhan and Mookherjee](#). Here, the incumbent party can withhold the distribution of private benefits to residents who did not vote for it in the previous election. The descriptive literature on clientelism describes many ways that secret ballots can be circumvented and party officials can monitor how each citizen votes.⁹

⁹Even if such methods are not possible, residents’ votes can be inferred from their expressions of public support (e.g., attendance in party rallies) on the eve of the election. Party operatives need only monitor attendance in these rallies, and condition allocation of private benefits on attendance (e.g., provide the benefit only if the resident attended the rally organized by the party that won the last election, and did not attend the pre-election rally of the opponent party). Residents attending the rally of a party then have an incentive to vote for it.

In such a setting, voting decisions additionally incorporate strategic considerations — if they vote for the party that ends up losing the election they will be punished by the winner and lose their access to private benefits. Each resident will compare expected utility of voting for either party, incorporating beliefs regarding the winner of the election (denoted by p_L , the probability that L wins). The expected utility of a member of group g with preference $\tilde{\theta}$ for the L party in period $(t + 1)$ upon voting for L is

$$\tilde{\theta} + p_L \sum_{k \in \mathcal{R} \cup \mathcal{P}} \beta_{kg} \pi_{kg}^L + (1 - p_L) \sum_{k \in \mathcal{P}} \beta_{kg} \pi_{kg}^T \quad (3)$$

since if it wins, T will withhold distribution of private benefits to this household in the next period. Conversely, the household will obtain an expected utility of

$$p_L \sum_{k \in \mathcal{P}} \beta_{kg} \pi_{kg}^L + (1 - p_L) \sum_{k \in \mathcal{P} \cup \mathcal{R}} \beta_{kg} \pi_{kg}^T \quad (4)$$

if it votes instead for T. Comparing (3) with (4), we see that the resident will vote for L if

$$\tilde{\theta} + \sum_{k \in \mathcal{R}} \beta_{kg} [p_L \pi_{kg}^L - (1 - p_L) \pi_{kg}^T] > 0 \quad (5)$$

Therefore, public goods distributed by either party no longer matter: voting decisions depend only on a comparison of private benefits distributed by either party, weighted by their respective likelihoods of winning.

This generates a fundamental difference between program politics and clientelism: in the latter, voters weigh the expected personal consequences of their voting decisions. If the candidate they vote for loses the election, they will be punished by the subsequent incumbent. This punishment consists of the denial of private benefits earmarked for their group. By the very nature of public goods, they cannot be excluded from what will be provided by the incumbent. Hence, only private transfers matter, not public goods. Voting no longer reflects citizens' comparative evaluation of the policies of competing candidates.

The resulting vote share of L in the village is

$$\sigma_v^c = \bar{\theta}_v + \sum_g \mu_{vg} s_{vg} \sum_{k \in \mathcal{R}} \beta_{kg} [p_L \pi_{kg}^L - (1 - p_L) \pi_{kg}^T] \quad (6)$$

4.3 Second Stage GP (Within-Village) Allocations

Elected officials controlling the GP allocate private benefits in period t to maximize the vote share of their own party in the next election. Expressions (2) and (6) show that under both program politics and clientelism, officials in either party have a dominant strategy $\{\pi_{kg}^*\}$, which maximizes $\sum_g \mu_{vg} s_{vg} \beta_g \pi_{kg}$ subject to $\sum_g \mu_g \pi_{kg} = B_{kv}$. Hence policies of GP incumbents will be the same under program politics and clientelism (i.e, in the latter among those that vote in favor of the incumbent).¹⁰ From these conditions, we can characterize within-village allocations and the resulting vote shares in the next election.

Consider any GP with village v that receives a budget B_{kv} for program $k \in \mathcal{P} \cup \mathcal{R}$. Under either program politics or clientelism, private benefit k will be allocated within the village by a GP as follows. Groups will be ranked in order of priority according to the distributional characteristic $\delta_{vg} \equiv s_{vg} \beta_{kg}$. Define g^* as follows: it is the group g with the lowest value δ_{vg} , such that $B_{kv} \geq \sum_{\{g': \delta_{vg'} \geq \delta_{vg^*}\}} \mu_{vg'}$. Then π_{kg} equals one for all groups g with $\delta_{vg} > \delta_{vg^*}$ and zero for all groups with $\delta_{vg} < \delta_{vg^*}$, with $\pi_{kg^*} = \frac{B_{kv} - \sum_{\{g': \delta_{vg'} \geq \delta_{vg^*}\}} \mu_{vg'}}$. The resulting vote share of the L party in program politics will be

$$\sigma_v = \bar{\theta}_v + I_v \alpha \sum_{k \in \mathcal{R}} \left[\sum_{\{g: \delta_{vg} > \delta_{vg^*}\}} \mu_{vg} (\delta_{vg} - \delta_{vg^*}) + \delta_{vg^*} B_{kv} \right] + I_v \alpha \sum_{k \in \mathcal{P}} \left(\sum_g \mu_{vg} \delta_{vg} \right) B_{kv} \quad (7)$$

and will thus respond both to private and public benefits allocated to the village. Under clientelism, the share will be

$$\sigma_v = \bar{\theta}_v + I_v (2p - 1) \sum_{k \in \mathcal{R}} \left[\sum_{\{g: \delta_{vg} > \delta_{vg^*}\}} \mu_{vg} (\delta_{vg} - \delta_{vg^*}) + \delta_{vg^*} B_{kv} \right] \quad (8)$$

where $I_v = 1$ or -1 depending on whether the GP is controlled by the L or T party, respectively; and p denotes voter beliefs that the current incumbent will be re-elected. Votes will respond only to the private benefits allocated.

¹⁰However, in clientelism private benefits are denied to those who voted for the losing party, resulting in a budgetary surplus. This could potentially be used to provide more benefits to those that voted for the incumbent. We avoid this complication by assuming that benefits denied to those voting for the losing party are diverted for personal use by party members, or disposed of. This simplifies the model without changing any of the qualitative conclusions that follow.

The within-village allocation of a private benefit program k will thus be as follows. Different voter groups will be ordered by their “swing-weighted” benefit $\delta_{vg} = s_{vg}\beta_{kg}$; the GP will allocate the benefit to groups with the highest priority until the budget is exhausted. Define $\nu_{kv} \equiv \frac{\partial \sigma_v}{\partial B_{kv}}$, the marginal vote-generating effectiveness of benefit k in village v . In both program politics and clientelism, ν_{kv} is proportional to $I_v \delta_{vg}^*$, positive for the incumbent and negative for the challenger. In program politics, the factor of proportionality is α the incumbency advantage parameter; in clientelism, it is $2p - 1$, which depends on voter beliefs that the incumbent will be re-elected.¹¹

The key distinction between program politics and clientelism is thus the effect of public benefits on voter support. ν_{kv} is positive under program politics and zero in clientelism. In addition, the vote-generating effectiveness of private benefits depends on the incumbency parameter α in program politics and on voter beliefs p that the incumbent will be re-elected in clientelism. This distinction is blurred if incumbency advantage is related to voter perceptions of re-election likelihoods.

4.4 First-Stage PS (Across-Village) Benefit Allocations

Now consider the decisions made by the government controlling C_i , given the budget allotment B_{ki} that it has received from the government one tier above. The vote share of party L in C_i is $\sigma_i \equiv \sum_{v \in C_i} n_v \sigma_v$. Anticipated village vote shares σ_v depends in turn on benefit program budgets B_{kv} allocated to the corresponding GPs, as described in (7) and (8).

As in standard models of probabilistic voting, we assume the probability that the party L candidate wins constituency C_i equals $p(\sigma_i)$, a smooth monotone increasing function of its

¹¹These expressions would be modified when private benefits are of a one-time nature rather than recurring. ν_{kv} will be smaller compared with recurring private benefits because households that have already received a one-time benefit are not eligible to receive it again. Hence, current distributions will not motivate current or past recipients. Only those who are yet to receive the benefit will be motivated by the likelihood of receiving it in the future, which they gauge by observing current distribution patterns. The marginal utility β_{kg} will thus be weighted by the fraction of members of group g who are yet to receive it. This adjustment will lower the distributional characteristic of a one-time benefit relative to a recurring benefit for any group. Hence one time private benefits will generate a smaller vote share response compared to a recurring private benefit. The adjustment would apply equally in both program politics and clientelism.

aggregate vote share. The function p smooths the likelihood of winning, owing to possible randomness in turnout or vote-counting errors.

The party controlling C_i is the party that controls the corresponding PS. Let $I_i = 1, -1$, depending on whether C_i is controlled at t by the L or the T party. The incumbent party selects an inter-village allocation $B_{kv}, k = 1, \dots, K$ to maximize

$$I_i R p\left(\sum_{v \in C_i} n_v \sigma_v\right) - \frac{d}{2} \sum_{v \in C_i} \sum_k n_v (B_{kv} - B_{ki})^2 \quad (9)$$

subject to village-level vote-share equations (7) or (8) under program politics and clientelism, respectively, and the budget constraint $\sum_{v \in C_i} n_v B_{kv} = B_{ki}, k = 1, \dots, K$. R denotes exogenous political rents of office, and B_{ki} is the budget the PS receives from the next-highest tier at the district level. The first term in (9) represents the objective of enhancing re-election prospects, which motivates the incumbent party to bias inter-village allocations in favor of villages where benefit programs are likely to generate most votes for the C_i incumbent. Budget distortions impose a cost proportional to the variance of the resulting inter-village allocation, represented by the second term in (9).¹² The parameter d is assumed to be large enough to ensure that the objective function (9) is concave over the relevant range of vote shares, so that optimal allocations are characterized by interior first-order conditions.¹³

The first-order conditions for this maximization problem provide the following characterization of the optimal inter-village allocation.

Proposition 1. *The optimal inter-village allocation of program k across GPs located in constituency C_i satisfies*

$$B_{kv}^* = B_{ki} + \frac{R}{d} p'_i(\sigma_i^*) [\nu_{kv} I_i I_v - \sum_{v'} n_{v'} \nu_{kv'} I_i I_{v'}] \quad (10)$$

where B_{ki} denotes the per capita budget for the constituency, and σ_i^* denotes the resulting equilibrium vote share of the L party.

The inter-village allocation of benefit k within constituency C_i is biased in favor of village v by an extent that depends on the following factors: (a) ν_{kv} : how effective the benefit is in

¹²This represents the cost of coping with complaints of unfair treatment from village-level representativeness, media watchdogs, or auditors appointed by upper-level governments.

¹³We need d bigger than $R p''(\sigma_i^*) (n_v I_v \nu_k)^2$ for all v, k holds at the equilibrium vote share σ_i^* .

generating votes; (b) p'_i : how competitive the constituency is; and (c) $I_v I_i = 1$ or -1 : whether political control is aligned between the two tiers. This yields the following corollary.

Corollary 1. *(a) In clientelism (resp. program politics), public benefits will not (resp. will) respond to shocks in political competitiveness.*

(b) For private benefits under either program politics or clientelism, aligned GPs (where $I_i I_v = 1$) will receive higher (per capita) budgets than their non-aligned counterparts (where $I_i I_v = -1$). Non-aligned GPs will receive less in more competitive constituencies, while aligned ones will receive more. The opposite will be the case if the GP is redistricted to a less competitive constituency.

Hence, alignment and competitiveness determine the direction and extent of the budgetary manipulation by the upper-tier government, as illustrated in Figure 3. We obtain the following testable predictions concerning the effects of redistricting: (1) Redistricting to a more competitive constituency will result in a larger (smaller) program scale in aligned (non-aligned) HC redistricted GPs, compared to non-redistricted GPs, thus resulting in a larger gap between the aligned and non-aligned GPs in this group. (2) Within aligned GPs, those redistricted to more competitive constituencies will receive larger allocations than those redistricted to less competitive ones. The opposite will be the case for non-aligned GPs. Finally, in program politics these patterns will appear for both public and private programs, whereas in clientelism they will appear only for private benefit programs.

5 Empirical Results

5.1 Effects of Redistricting on Inter-Village Benefit Allocations

In this section, we test these predictions and make inferences about the prevalence of clientelism vis-a-vis program politics. The time period 2004 - 2006 constitutes the pre-redistricting years, and 2007 - 2008 the post redistricting years. Since our treatment groups are defined

partly by alignment of political control at the GP and PS levels, we restrict attention in this section to the years 2004-2008 since alignment did not change during this period.¹⁴

Our empirical strategy is illustrated in Figure 2. GPs are represented by black dots. The brown and black solid contours respectively define the old and new boundaries between different assembly constituencies C1 and C2. Some GPs continue to remain in the same constituency, while some (such as the black dot with a brown circle around it) happen to move from C2 to C1. If C1 is a more contested constituency, changes in vote share in the redistricted GP will matter more in determining the winner of the subsequent assembly election. Hence the party controlling the PS will manipulate the budgetary allocation to the redistricted GP in a direction depending on political alignment. If the GP is controlled by the rival (resp. same) party, the PS will reduce (resp. increase) the allocation. This applies only for benefit programs with a significant positive effect on voting patterns. Hence we can infer which benefit programs are expected to affect votes, by observing which ones are manipulated in the predicted directions.

Table 4 provides linear probability regressions of the likelihood that any given village belonged to the control group or either of the four treatment groups of redistricted villages (defined by alignment and competitiveness effect). Besides a range of village characteristics representing landownership, occupational, caste, religion and immigration, the remaining regressors reflect possible political motives of incumbents to manipulate the process: party controlling the GP, PS; alignment; whether it was represented by an MP or MLA with a seat in the Delimitation Commissions; and whether the assembly constituency seat was reserved for Scheduled Caste (SC) or Scheduled Tribes (ST) candidates. Iyer and Reddy (2013) found that the last two regressors helped predict the likelihood of redistricting in Andhra Pradesh and Rajasthan. In contrast, for our sample in West Bengal, Table 4 shows that none of these variables are individually significant predictors of the likelihood of belonging to any of the treatment groups. They are, however, jointly significant in predicting HC redistricting, although the F-statistics are small.

¹⁴Recall that local government elections were held in 2003 and 2008.

Consider first the regression specification where we focus on the effects of HC redistricting (i.e., to a more competitive constituency). Let B_{vt} denote the per capita benefits of any specific category reported by residents in village v in year t . We express this in standardized units (subtract each village-year observation by the sample mean and divide by the standard deviation).

$$B_{vt} = \alpha_0 + \alpha_1 P_t * HCR_v * A_v + \alpha_2 P_t * HCR_v + \beta X_{vt} + F_v + \tau_t + \epsilon_{vt}$$

where '*HC Redistricted*' is a dummy for HCR villages, '*Aligned*' (A_v) is a dummy for control by the same party at both the PS and GP levels, and '*Post*' is a dummy for post-2007 years. X_{vt} includes each of these three variables and pairwise interactions, and dummies for representation on the delimitation commission by the MLA or MP of the original constituency. F_v and τ_t are village and year dummies respectively. ϵ_{vt} is the error term; standard errors are clustered at the PS level. The theory predicts $\alpha_1 > 0, \alpha_2 < 0, \alpha_1 + \alpha_2 > 0$ for any benefit program which affects household votes positively, and all zero for benefits that do not affect voting patterns.

The full specification involves four different treatment groups, classified both by alignment and changes in competitiveness. Villages redistricted to less competitive constituencies (larger victory margins) are referred to as LCR (LC redistricted) villages. As illustrated in Figure 3, the theoretical predictions for LCR villages are the reverse of those for HCR villages. So we run the following regression:

$$B_{vt} = \alpha_0 + \alpha_1 P_t * HCR_v * A_v + \alpha_2 P_t * HCR_v + \alpha_3 P_t * LCR_v * A_v + \alpha_4 P_t * LCR_v + \beta X_{vt} + F_v + \tau_t + \epsilon_{vt}$$

where *LCRedistricted* denotes a dummy for an LCR village. Here the control group comprises non-redistricted villages. The theoretical predictions now are $\alpha_1 > 0 > \alpha_2, \alpha_1 + \alpha_2 > 0, \alpha_3 < 0, \alpha_4 > 0, \alpha_3 + \alpha_4 < 0$ for programs that affect votes, and all zero otherwise.

The top panel in Figure 7 plots the time trends for private benefits across the four treatment groups and control group. The top left panel considers the two treatment groups correspond-

ing to aligned GPs; the one on the right is the corresponding plot for non-aligned GPs. In both cases, trends prior to 2007 seem parallel. The post-2007 changes are consistent with the model's predictions: relative to the control group we see an increase in HCR aligned villages and a decline in LCR aligned villages. The bottom panel displays corresponding plots for public benefits. Trends prior to 2007 are the same for the aligned and non-aligned groups compared with the control group. And in contrast to the top panel, we do not see any sharp changes post-2007 relative to the control group. Nevertheless, we see fixed level differences across groups prior to 2006, which are captured by the village dummies in the regression. We will also check robustness of the regression results to inclusion of controls for group-specific pre-trends.

The regression results for this specification are shown in Table 5. For private and public benefits, columns 1 and 2 first show results when we combine the two treatment groups into a single treatment group, comprising GPs redistricted to more competitive constituencies irrespective of alignment. We see no significant differences between the combined treatment group and the control group. Columns 3 and 4 then show results for the specification dictated by the theory, which separates the two treatment groups distinguished by alignment. Consistent with the predictions of the model, the gap for effects on private benefits between the aligned and non-aligned treatment groups is significantly larger than for the control group (by 3.56 s.d.). For the GPs in the non-aligned (resp. aligned) treatment group, the program scales contract (resp, expand) by 2.6 (resp. 0.97) s.d. which is statistically significant (insignificant) at the 1% level. For public benefits on the other hand, the results are consistent only with the clientelism model: the differential effects for the two treatment groups are much smaller (within ± 0.2 s.d.) and statistically indistinguishable from zero. The difference in statistical significance cannot be attributed to greater imprecision of the public benefit estimates, as they have lower standard errors.

The last two columns of Table 5 show results for the more demanding specification with four treatment groups defined both by competition and alignment. For public benefits (column 6) none of the treatment effects are significant. For private benefits (column 5) and HC

redistricted villages we continue to see the same results as before ($\alpha_1 > 0, \alpha_2 < 0, \alpha_1 + \alpha_2 > 0$). For the LC redistricted villages, the estimated coefficients are consistent with the model's predictions ($\alpha_3 < 0, \alpha_4 > 0, \alpha_3 + \alpha_4 < 0$) but are statistically insignificant. However, the bottom panel of the table shows that within the aligned as well as within the non-aligned groups of redistricted villages, the predicted effects of varying competition are statistically significant: the LCR-aligned effect is smaller than the HCR-aligned effect ($\alpha_4 - \alpha_2 > 0$, p-value = .02), and the LCR-nonaligned effect is larger than the HCR-nonaligned effect ($(\alpha_1 + \alpha_2) - (\alpha_3 + \alpha_4) > 0$, p-value=.03).

The preceding results aggregated different types of private benefits, which may raise concerns about biases and interpretation. Table 6 shows the corresponding results for employment programs (columns 1 and 2), which are similar to those for aggregate private benefits. These results are not confined to employment programs alone: columns 3 and 4 provide corresponding regressions for all private benefits excluding employment programs. Column 5 show that the absence of significant effects on the allocation of public benefits continues to hold when they include drinking water access. The Online Appendix shows more detailed results for each type of benefit separately. It also shows that the results are robust to inclusion of pre-2007 trends specific to each treatment group and the control group separately.

Table 7, columns (1) and (2), present results from a placebo test using data for the pre-redistricting period 2004 - 2006, with the redistricting date hypothetically moved ahead by one year to the end of 2005 (so 2006 constitutes a post-redistricting year, while 2004 and 2005 are prior years). For private benefits, we no longer see any significant effects, and the same continues to be true for public benefits. These results also provide evidence against the possibility that PS's may have anticipated the redistricting a year in advance and reallocated budgets accordingly. Columns (3) and (4) present results for a specification with placebo treatment groups. These groups are constructed as follows: we take the sub-sample of villages that were not redistricted in 2006. For all these villages, there was no change in competition at the *Panchayat Samiti* level in the period 2004-2008. We then randomly assign a subset of villages into 'Placebo HCR' group and a subset of villages in 'Placebo LCR' group. The post

period is 2007 onwards. The results show that there is no effect of placebo treatment groups on private and public benefits allocations. This suggests that differences in alignment by themselves do not seem to have an effect on changes in allocation of benefits across villages.

In summary, the results confirm the predictions of the clientelistic model: we see large significant effects on the program scales of private benefits and negligible insignificant effects for public benefits; these results appear only once redistricting occurs and not before. The short time span studied allows us to focus only on short run effects of the redistricting. This is not a problem for various reasons. We are not interested in the effects of redistricting *per se*, and use it only as a source of exogenous shock to political competition to infer the underlying mechanisms of how benefits of different kinds affect voting, and how allocation of benefits are manipulated by upper tiers of the government in response. Moreover, we do not expect any long lasting effects, since with the 2008 panchayat elections the patterns of alignment would change. And political competition changed in the wake of the 2009 parliamentary election and then again even more decisively in the 2011 state assembly election.

5.2 Household-Level Analysis: Effects of Benefits on Political Support

We now turn to investigate the relative effectiveness of benefits of different kinds in generating political support at the household level. Since there was no poll conducted during 2004 - 2007, we do not have data on political support before the redistricting. We therefore examine cross-sectional differences in the likelihood of households expressing support for the GP incumbent in the 2011 poll. Column 1 of Table 8 reports OLS regression results for how the likelihood of the head of households voting for the incumbent party in our post-election poll varied with number of private and public benefits received between 2009 and 2011. We restrict attention to benefits received during this period because the previous GP elections were held in 2008, so there is a single well-defined incumbent at the GP level after 2008. The regression specification is

$$L_{iv} = \sum_k \nu_k b_{kiv} + \beta X_{iv} + \alpha_{d(v)} + \epsilon_{iv} \quad (11)$$

where L_{iv} is a dummy for the incumbent party supported in the 2011 post-election poll by household head i in village v , b_{kiv} is a standardized measure of the number of benefits of type k reported by the household over the 2009 - 2011 period, X_{iv} is a vector of household and village controls (including household characteristics (dummies for SC/ST, religion, landlessness, occupation, and whether the head of household is educated), GP characteristics (dummies for Left Front control of GP and alignment with PS control)), and $\alpha_{d(v)}$ represents district fixed effects.

The average per household private benefits over this period is 0.24 and the standard deviation is 0.57. The corresponding numbers for public goods are 0.06 and 0.24. Column 1 of Table 8 shows a positive, significant OLS estimate of the effect of receiving a one standard deviation increase in private benefits which raised the likelihood of the household head voting for the incumbent by 2.4% and is statistically significant at the 5% level. The corresponding effect for public benefits is -0.9% and statistically insignificant.

To address possible sources of OLS bias such as omitted variables (weaker incumbents were motivated to provide more benefits) or reverse causality (targeting of benefits to loyal supporters rather than swing voters), we now provide IV estimates, using a strategy similar to Levitt and Snyder Jr (1997). To explain this, we return to the budgeting equation (10), applied to a specific program in a given constituency or district:

$$B_v = \bar{B} + \theta_v - \sum_{v'} n_{v'} \theta_{v'} \quad (12)$$

where B_v denotes the scale allocated to village v , \bar{B} the given scale in the district, n_v is the population share of village v and θ_v is the ‘political characteristic’ of village v representing the product of ‘competitiveness’ $\frac{Rp'}{d}$, alignment $I_i I_v$ and ν_v the vote generating effectiveness of the program in village v . Since the political characteristic of a village is related to voting propensities of its residents, equation (12) shows the pattern of reverse causation that biases the OLS estimate of the effect of benefits on votes in regression (11).

Assuming that the political characteristics of different villages are drawn from an i.i.d.

distribution conditional on a district-specific parameter, we can take a random sample I of *other* villages in the district. For any such village v' in I , the same budget equation (12) applies, hence

$$B_{v'} = \bar{B} + (1 - n_{v'})\theta_{v'} - n_v\theta_v - \sum_{v'' \neq v, v'} n_{v''}\theta_{v''} \quad (13)$$

As the population share of each village goes to zero, this implies the correlation between $B_{v'}$ and θ_v goes to zero, while the correlation with its own characteristic $\theta_{v'}$ is bounded away from zero. So the average grant in the set I of other villages in the district which helps predict $\sum_{v'} n_{v'}\theta_{v'}$ and hence also B_v (using (12)), is an asymptotically valid instrument for B_v . Even if population shares of each village are not close to zero, they are typically less than $\frac{1}{2}$, so the bias in the IV estimator will be smaller than of the OLS estimator.¹⁵

Hence we instrument program scale by program scales in other villages in the same district, interacted with dummies for fixed household characteristics H_{iv} such as caste, landlessness, education, and religion (significant determinants of within-GP targeting) to predict the delivery of benefits to individual households. The first-stage and second-stage regression specifications are as follows.

$$\textit{First Stage: } b_{ivk} = \tau_1 S_{d(v)} * H_{iv} + \tau_2 S_{d(v)} + \tau_3 H_{iv} + \tau_4 X_{iv} + \theta_{d(v)} + \eta_{ivk}$$

$$\textit{Second Stage: } L_{iv} = \sum_k \nu_k \bar{b}_{ivk} + \rho_1 H_{iv} + \rho_2 X_v + \alpha_{d(v)} + \epsilon_{iv} \quad (14)$$

where \bar{b}_{ivk} denotes predicted benefits of type k received by the household, obtained from the first-stage regression.

Columns 2 and 3 of Table 8 report the results of the first stage regressions. The coefficient of $S_{d(v)}$ is negative for both private and public benefits, which is what we would expect from the budgeting rule (12). The interaction effects with caste, education and religion are significant in the case of private benefits, and with caste for public benefits. The F-statistic for significance of excluded instruments suggest that the instruments are weak, especially for public goods. However, the identification rank test shows the instruments provide enough

¹⁵The coefficient of θ_v in expression (13) for $B_{v'}$ equals n_v , whereas its coefficient in expression (12) for B_v equals $1 - n_v$.

independent variation in the two endogenous variables. For inference with weak instruments, we follow [Andrews et al. \(2019\)](#). The weak-instrument-robust Lagrange multiplier test statistic for joint significance of coefficients of the two endogenous variables is significant at the 5% level. The weak-instrument-robust Hansen J test of overidentifying restrictions does not reject the null hypothesis that the restrictions are valid.

The IV estimate for effect of private benefits on the likelihood of the household head voting for incumbent is 14%, much larger than the OLS estimate. Even if the IV is not unbiased, it is likely to be less biased than the OLS estimate, so the contrast between the OLS and IV estimate indicates the OLS bias is negative. This is consistent with the hypothesis that weaker incumbents provide more benefits, and with targeting of benefits to swing rather than loyal voters. In contrast, the effect of receipt of public benefits is actually negative (-8%), and statistically insignificant (with a standard error of 8%). So the evidence in favor of clientelism continues to be upheld at the household level, and mirrors the pattern of manipulation of GP budgets by upper tiers shown in the previous section.

6 Concluding Observations

This paper examines allocation of benefits under various government programs to isolate patterns consistent with clientelism. Under clientelism, private benefits are effective in generating votes but public goods are not. The evidence for this is provided in two different ways. One examines variation in local-government program scales as a result of plausibly exogenous shocks to political competition. The other studies how the political support expressed by individual heads of household responded to variations in benefits they received, induced by variations in average program scale at the district level. The results corroborate each other in a manner predicted by a theoretical model of politically manipulated budgets that reflects the way household votes respond to private vs. public programs.

This paper does not explore the welfare implications of clientelistic practices. Whether public benefits were under-provided, or whether the induced allocation of benefits between

villages and households improved or worsened equity or efficiency are important questions for evaluating policies. If such distortions exist, an alternative policy of replacing existing programs with programmatic, formula-bound transfers made directly to households may be desirable. While our voting results suggest this may enhance political competition and the supply of public goods, structural estimation of the model would be needed to estimate possible impacts. An alternative but less radical reform would let GPs retain discretion over intra-village allocation of benefits while replacing the current system with direct, formula-based transfers to GPs.¹⁶ This approach would alter inter-GP allocations while leaving intra-GP targeting patterns unchanged. The findings of this paper could be used to estimate resulting effects on targeting to the poor or low-caste groups. This is a task we leave for future research.

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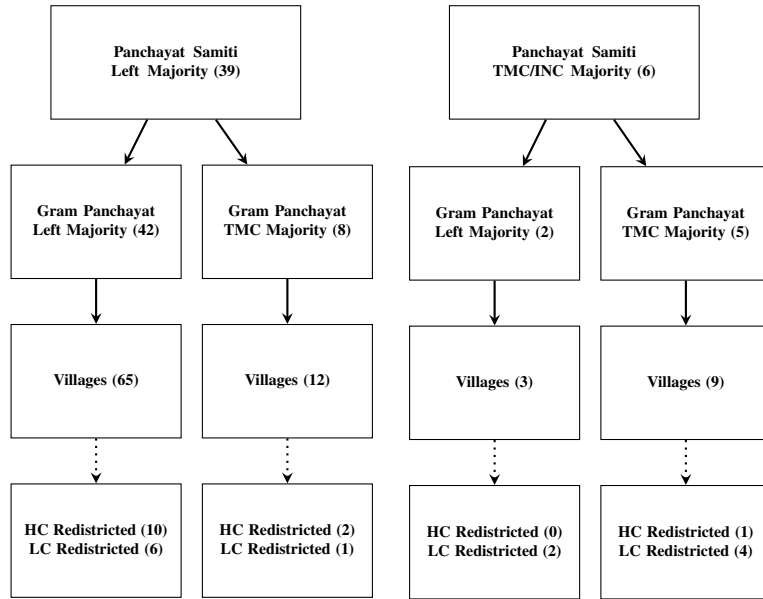
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¹⁶Faguet (2004, 2006) argues the adoption of formula-based grants to local governments in the 1995 decentralization reform in Bolivia dramatically reduced inequality of public expenditures between rural and urban areas.

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Figure 1: Bottom Tiers of Local Government Hierarchy and Redistricting



Notes: *Panchayat Samiti Majority* variables are defined according to 2003 panchayat election results. Redistricting is at the assembly-constituency level. *HC Redistricted* refers to those cases where the village was redistricted to an assembly constituency with a smaller gap in vote share between winner and runner up. *LC Redistricted* refers to those cases where a village was redistricted to an assembly constituency with an equal or a larger gap in vote share between winner and runner up.

Figure 2: Redistricting of Villages

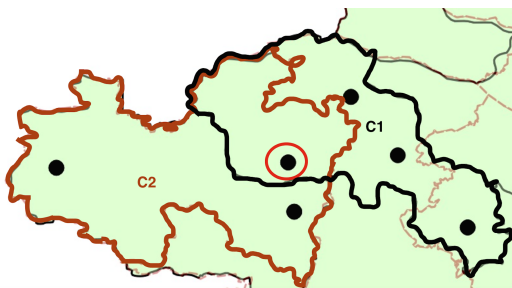


Figure 3: Theoretical Predictions

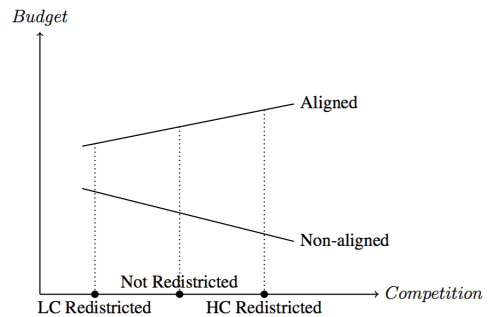
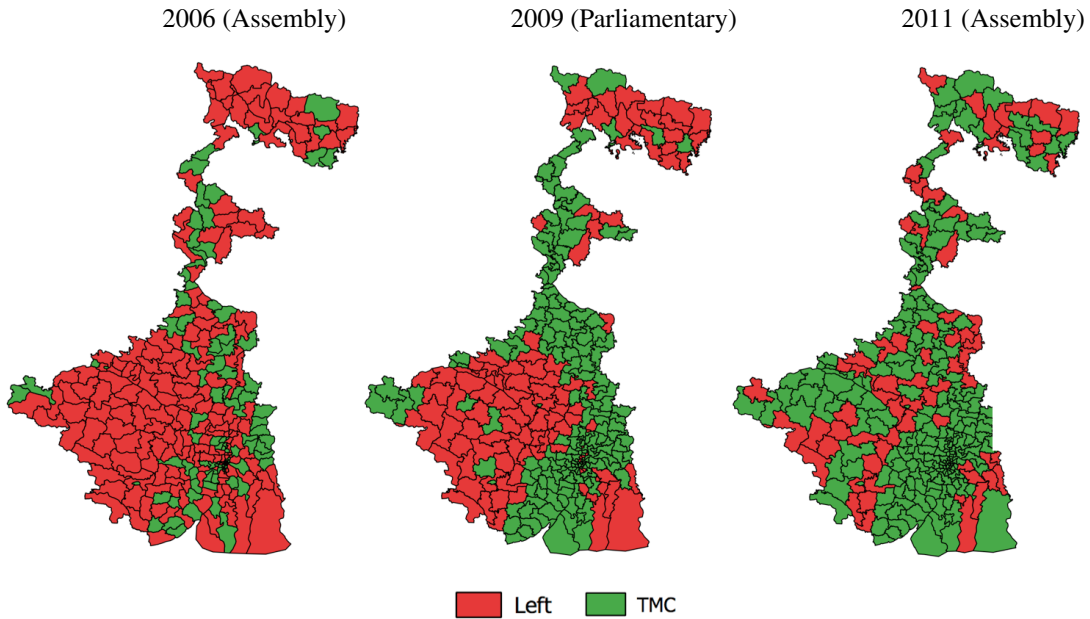


Figure 4: Changes in Electoral Outcomes for the Left Front



Note: Voting outcomes are aggregated to assembly-constituency level.

Figure 5: Change in Competition

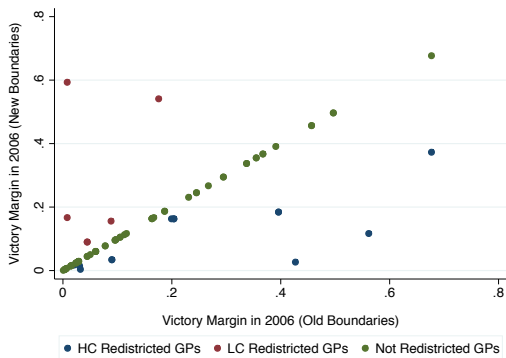


Figure 6: Vote Share for the Left Front

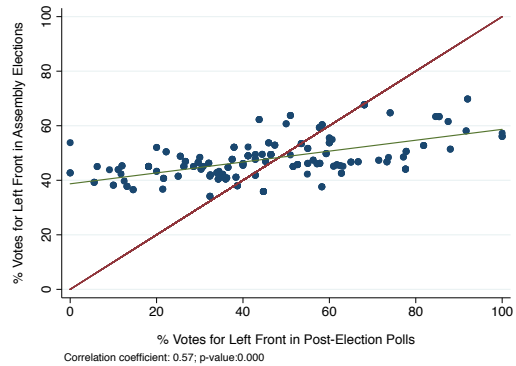


Figure 7: Trends in Private and Public Benefits

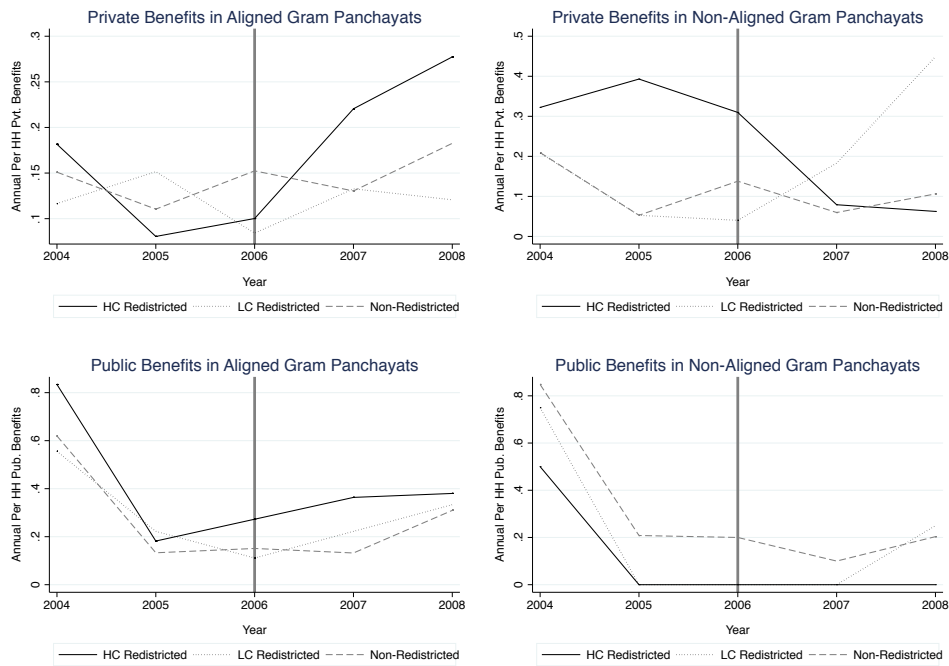


Table 1: Official Election Results and Post-Election Poll Responses

Party Vote Shares (%)	Official Election Results*		Results from Poll Responses	
	2006	2011	2006	2011
TMC	24	35	11	45
Left Front	50	42	58	34
INC	16	12	19	12
Others	11	12	5	2
Voter Turnout (%)	84	86		
Didn't Respond			7	7

* The official election results are reported only for constituencies in which the survey was conducted.

Table 2: Summary Statistics: Demographics

Agri Land Owned in 2004	No. of Households	Average Age	Characteristics of Head of Households			
			% Males	Years of Schooling	% SC/ST	% in Agriculture
Landless	1214	45	88	6.6	37.4	26
0-1.5 Acres	658	48	88	7.8	38.9	65
1.5-2.5 Acres	95	56	92	10.8	22.4	82
2.5-5 Acres	258	58	93	11.1	27.1	72
5-10 Acres	148	60	89	12.5	26.1	66
> 10 Acres	29	59	100	13.9	30.9	72
All	2402	49	89	8.0	35.4	47

Table 3: Summary Statistics: GP-Disbursed Benefits Received by Households

	Percentage of Households Reporting Receiving Benefits (Annual)		
	(2004-2006)	(2007-2008)	(2009-2011)
Any Benefit	12.30	9.68	6.92
Private Benefits	9.77	9.30	6.18
Employment*	5.36	5.77	3.05
Minikits	1.90	0.58	1.04
House or Toilet	1.85	0.52	0.76
BPL Cards	1.46	1.81	2.16
Drinking Water	1.29	1.71	0.82
Credit	0.37	0.10	0.14
Public Benefits	4.29	0.98	1.96
Road	4.22	0.98	1.96
Irrigation	0.12	0.00	0.00

**Employment* includes panchayat-provided employment, MNREGA, and MPLAD employment.

Table 4: Predicting Redistricting

	Not	HC Red.*	HC Red. *	LC Red. *	LC Red. *
	Redistricted	Aligned	Non-Aligned	Aligned	Non-Aligned
	(1)	(2)	(3)	(4)	(5)
Left Panchayat Samiti	0.35 (0.22)	-0.02 (0.06)	0.11 (0.08)	-0.21 (0.18)	-0.24 (0.18)
Left Dominated GP	-0.01 (0.11)	0.10 (0.07)	-0.13 (0.08)	-0.06 (0.06)	0.10 (0.10)
Left Won 2006 Assembly	0.01 (0.11)	0.02 (0.09)	-0.04 (0.05)	0.02 (0.07)	-0.00 (0.05)
Delimitation Commission Member	-0.16 (0.11)	0.16 (0.12)	-0.01 (0.03)	0.05 (0.10)	-0.04 (0.05)
Seat Reserved for SC/ST	-0.04 (0.16)	0.04 (0.10)	-0.03 (0.04)	0.03 (0.06)	-0.00 (0.02)
Proportion of HH Immigrated to Village Before 2004	-0.04 (0.34)	-0.24 (0.17)	0.03 (0.12)	0.03 (0.16)	0.22 (0.13)
Proportion of SC/ST HHs	0.42** (0.19)	-0.22 (0.14)	0.03 (0.06)	-0.14 (0.14)	-0.10 (0.08)
Proportion of Hindu HHs	-0.18 (0.14)	0.16 (0.11)	-0.09 (0.06)	0.21* (0.11)	-0.10 (0.09)
Proportion Cultivators	-0.10 (0.31)	0.10 (0.19)	-0.07 (0.08)	-0.08 (0.11)	0.16 (0.13)
Proportion Landless in 2004	0.08 (0.31)	-0.01 (0.14)	-0.08 (0.10)	-0.14 (0.16)	0.14 (0.16)
Observations	89	89	89	89	89
Adjusted R^2	0.029	-0.015	0.087	0.032	0.196
Mean Dependent Variable	0.71	0.12	0.02	0.10	0.04
F-statistic for testing joint significance	4.83	2.98	2.71	0.87	1.48
p-value	0.00	0.03	0.04	0.58	0.23

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Robust standard errors in parentheses, clustered at panchayat samiti level. *HC Redistricted* refers to those cases where the village was redistricted to an assembly constituency with a smaller gap in vote share between winner and runner up. *LC Redistricted* refers to those cases where a village was redistricted to an assembly constituency with an equal or a larger gap in vote share between winner and runner up. *Aligned* is a dummy that takes value 1 if the same party is in power at the GP as well as at Panchayat Samiti. *Seat Reserved for SC/ST* refers to Assembly constituency seats. *Left Won 2006 Assembly* takes value 1 if the Assembly constituency the village belongs to was won by Left Front in 2006.

Table 5: Effect of Competition and Alignment on Benefits Distributed

	Effect of High Competition		Effect of Alignment (Given Competition)		Effect of Alignment (HCR and LCR Villages)	
	Private (1)	Public (2)	Private (3)	Public (4)	Private (5)	Public (6)
Post* HC Redistricted	0.42 (0.76)	0.07 (0.34)	-2.59*** (0.68)	0.17 (0.43)	-1.93*** (0.37)	0.29 (0.42)
Post* HC Redistricted* Aligned			3.56*** (0.98)	-0.13 (0.57)	2.89*** (0.82)	-0.23 (0.57)
Post* LC Redistricted					2.33 (1.95)	0.41 (0.46)
Post* LC Redistricted* Aligned					-2.41 (1.93)	-0.23 (0.72)
Observations	445	445	445	445	445	445
Adjusted R^2	0.080	0.376	0.097	0.377	0.109	0.375
Mean Annual Per HH Benefits	0.53	0.43	0.53	0.43	0.53	0.43
SD Annual Per HH Benefits	1.77	1.35	1.77	1.35	1.77	1.35
Test: Post* HC Redistricted* Aligned + Post* HC Redistricted = 0						
F Statistic			1.70	0.01	1.60	0.03
P-value			0.20	0.92	0.21	0.87
Effect of Competition (Given Alignment)						
F-test for (Post* HC Redistricted* Aligned) = (Post* LC Redistricted* Aligned)						
F-Statistic					6.93	0.00
p-value					0.01	0.99
F-test for (Post* HC Redistricted) = (Post* LC Redistricted)						
F-Statistic					4.88	0.04
p-value					0.03	0.83

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, clustered at panchayat samiti level. [1] Observations at the village-year level, 2004-2008. Post takes value 1 for years 2007 and onwards. [2] The dependent variable is standardized measure of annual per-HH benefits for each village. [3] *High Competition or HC Redistricted* refers to those cases where the village was redistricted to an assembly constituency with a smaller gap in vote share between winner and runner up. *LC Redistricted* refers to those cases where a village was redistricted to an assembly constituency with an equal or a larger gap in vote share between winner and runner up. *PS* refers to panchayat samiti, and *Aligned* means same party is in power at both the PS and GP levels. [4] *Private benefits* include panchayat-provided employment, MNREGA, MPLAD, IRDP credits, agricultural minikits, ration cards, houses, toilets, and drinking water. *Public benefits* refers to roads and irrigation. [5] All specifications include other interaction terms, whether MLA/MP was part of delimitation committee, village and year fixed effects.

Table 6: Robustness: Effect of Competition and Alignment

	Employment		Private Benefits Without Employment		Public Benefits With Water	
	(1)	(2)	(3)	(4)	(5)	(6)
Post* HC Redistricted* Aligned	2.35** (0.87)	1.66* (0.88)	2.77*** (0.91)	2.32*** (0.81)	0.01 (0.65)	-0.14 (0.63)
Post* HC Redistricted	-1.86** (0.70)	-1.21* (0.69)	-1.84*** (0.55)	-1.38*** (0.34)	0.12 (0.44)	0.29 (0.43)
Post* LC Redistricted* Aligned		-2.49* (1.37)		-1.51 (1.76)		-0.42 (0.87)
Post* LC Redistricted		2.28 (1.41)		1.62 (1.67)		0.60 (0.60)
Observations	445	445	445	445	445	445
Adjusted R^2	0.005	0.014	0.095	0.098	0.331	0.329
Mean Annual Per HH Benefits	0.62	0.62	0.35	0.35	0.44	0.44
SD Annual Per HH Benefits	1.89	1.89	1.75	1.75	1.46	1.46
Test: Post* HC Redistricted* Aligned + Post* HC Redistricted = 0						
F Statistic	0.81	0.64	1.54	1.58	0.07	0.10
P-value	0.37	0.43	0.22	0.22	0.79	0.75
Effect of Competition (Given Alignment)						
F-test for (Post* HC Redistricted* Aligned) = (Post* LC Redistricted* Aligned)						
F-Statistic		11.3		4.25		0.07
p-value		0.00		0.05		0.79
F-test for (Post* HC Redistricted) = (Post* LC Redistricted)						
F-Statistic		7.97		3.32		0.19
p-value		0.01		0.08		0.66

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses, clustered at panchayat samiti level. [1] Observations at the village-year level, 2004-2008. Post takes value 1 for years 2007 and onwards. [2] The dependent variable is standardized measure of annual per-HH benefits for each village. [3] *High Competition or HC Redistricted* refers to those cases where the village was redistricted to an assembly constituency with a smaller gap in vote share between winner and runner up. *LC Redistricted* refers to those cases where a village was redistricted to an assembly constituency with an equal or a larger gap in vote share between winner and runner up. *PS* refers to panchayat samiti, and *Aligned* means same party is in power at both the PS and GP levels. [4] *Employment* consists of panchayat-provided employment, MNREGA and MPLAD employment. *Water* refers to drinking water. *Private benefits without employment* include IRDP credits, agricultural minikits, ration cards, houses, toilets, and drinking water. *Public benefits with water* consists of roads, irrigation and drinking water. [5] All specifications include other interaction terms, whether MLA/MP was part of delimitation committee, village and year fixed effects.

Table 7: Placebo Tests

	Placebo Shock		Placebo Treatment	
	Private (1)	Public (2)	Private (3)	Public (4)
Post * HC Redistricted* Aligned	0.24 (0.97)	-0.34 (1.06)	0.69 (1.41)	0.37 (1.26)
Post * HC Redistricted	-0.48 (0.85)	0.23 (0.99)	-0.99 (1.32)	-0.76 (1.19)
Post * LC Redistricted* Aligned	0.25 (1.20)	-0.04 (1.01)	0.27 (1.59)	-0.23 (0.63)
Post * LC Redistricted	-0.85 (1.08)	-0.14 (0.86)	-1.15 (1.35)	-0.35 (0.44)
Observations	267	267	365	365
Adjusted R^2	0.181	0.357	0.104	0.366
Mean Annual Per HH Benefits	0.44	0.55	0.48	0.41
SD Annual Per HH Benefits	1.50	1.39	1.74	1.34
F-test for (Post* HC Redistricted* Aligned) = (Post* LC Redistricted* Aligned)				
F-Statistic	0.00	0.09	0.28	0.27
p-value	0.99	0.76	0.60	0.61
F-test for (Post* HC Redistricted) = (Post* LC Redistricted)				
F-Statistic	0.29	0.22	0.09	0.16
p-value	0.59	0.64	0.77	0.69

* p<0.10, ** p<0.05, *** p<0.01. Robust standard errors in parentheses, clustered at panchayat samiti level. [1] Observations at the village-year level. [2] The dependent variable is standardized measure of annual per-HH benefits for each village. [3] *PS* refers to panchayat samiti, and *Aligned* means same party is in power at both the PS and GP levels. [4] *Private benefits* include panchayat-provided employment, MNREGA, MPLAD, IRDP credits, agricultural minikits, ration cards, houses, toilets, and drinking water. *Public benefits* refers to roads and irrigation. [5] All specifications include other interaction terms, whether MLA/MP was part of delimitation committee, village and year fixed effects. [6] For *Placebo Shock* regressions, the time period is 2004-2006. Post takes value 1 for 2006. *Redistricted* refers to cases where the GP was redistricted to an assembly constituency where the incumbent party has a lower likelihood of winning based on victory margins. [7] For *Placebo Treatment* regressions, the time period is 2004-2008. Post takes value 1 for years 2007 and onwards. *Redistricted* variables refer to placebo treatment groups constructed randomly using sub-sample of villages that were not redistricted in 2006.

Table 8: Effect of Benefits on Votes for Incumbent in 2011 Straw Polls

	OLS		IV Regression	
	(1)	First Stage		Second Stage
		(2)	(3)	(4)
Private Benefits	0.02** (0.01)			0.14** (0.06)
Public Benefits	-0.01 (0.02)			-0.08 (0.08)
$S_{d(v)}$		-0.80*** (0.10)	-0.94*** (0.11)	
$S_{d(v)}$ * SC/ST		0.17*** (0.06)	-0.15** (0.08)	
$S_{d(v)}$ * Landless		0.03 (0.07)	0.03 (0.08)	
$S_{d(v)}$ * No Education		0.16*** (0.06)	0.10 (0.07)	
$S_{d(v)}$ * Hindu		-0.15** (0.07)	0.15 (0.10)	
Observations	2383	2402	2402	2383
Adjusted R^2	0.181	0.240	0.402	0.132
Mean Votes for Left	0.52	0.00	-0.00	0.52
SD Votes for Left	0.50	1.00	1.00	0.50
F-Test of excluded instruments (p-value)		17.56 (0.00)	6.02 (0.00)	
Rank Test (p-value)				15.85 (0.00)
Weak-Instrument-Robust Tests:				
Lagrange Multiplier test [†] (p-value)				6.54 (0.04)
J -Overidentification test [§] (p-value)				4.60 (0.20)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ Robust SE in parentheses, clustered at village level in (1). † Ho: $\beta_{private} = 0$ and $\beta_{public} = 0$. § Ho: instruments valid i.e. $E(Zu) = 0$. [1] Private and public benefits are standardized and aggregated over period 2009-2011. [2] All specifications include household (HH) characteristics, GP characteristics, and district fixed effects. HH Characteristics include SC/ST, religion, landlessness, occupation, and level of education of household head. GP characteristics include dummy for left GP, dummy for left Panchayat Samiti (PS) and dummy for alignment between GP and PS. [3] Endogenous variables: private and public benefits. [4] Excluded instruments: standardized aggregate per capita total benefits ($S_{d(v)}$) and $S_{d(v)}$ *HH characteristics. HH characteristics used for instruments are: SC/ST, landless, no education and religion dummies.