

Are Transparency and Accountability Enough? Open Corruption and Why it Exists

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Abstract

The global movement against corruption has long assumed its demise lay in transparency and accountability. We test this assumption by measuring whether highly accountable Indian village council presidents favor their own households while making observable allocations of public works jobs. We link millions of public works records to election outcomes. We find that winners of close elections receive 3 times as many days of labor as losers, earning excess wages equaling two-thirds of the median president's salary. Using an original survey of council presidents we find suggestive evidence that corruption is "performance pay" used to attract talented candidates into office.

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1 Introduction

The exposure of corruption is often considered to be the key to its demise: Transparency International embodies this assumption in its name and in the position statements listed on its website.¹ And private anti-corruption initiatives like India's ipaidabribe.com focus their resources on building platforms that let citizens expose corrupt officials. These approaches hinge on the notion that corruption, the misuse of public office for private gain², is unpopular. They reason that officials will act honestly as long as corruption is visible and those who defy popular sentiment can be punished. That logic is embedded in theoretical models like Banerjee (1997), where corruption and red tape arise because the public, as represented by a benevolent government, cannot monitor self-interested officials. Recent empirical work has confirmed that a lack of accountability aggravates corruption.³ Yet the implicit assumption behind much anti-corruption policy—that corruption will vanish if only it can be made visible to a public empowered to hold officials accountable—remains untested.

We test this assumption by studying how village council presidents in the Indian state of Uttarakhand allocate a highly salient public benefit: jobs funded through a national make-work scheme (NREGS). We test whether council presidents award disproportionately large labor quotas to their own households. In this context, such self-dealing would amount to highly visible and punishable misuse of public office for private gain. Villages in Uttarakhand are small, with 80 percent of villages having fewer than 1000 inhabitants. Village council presidents are directly elected through competitive local elections. Since they continue living in the village among their constituents, they can be easily held accountable for their actions during their term, for example through social sanctions. The job allocations, which grant short-term jobs building public works within the village, are directly visible to constituents and posted on a widely known and publicly accessible government website. Since the work being done generally has no social value, these jobs are effectively a means of transferring income to households in need.⁴

¹On its website, Transparency International writes that the key characteristic of public procurement systems resistant to corruption is that “Above all, they’re transparent ... Then we can hold governments, bidders and contractors accountable for their actions.” The key to preventing politicians from being corrupt is to “demand that they put in place regulations which will force them to act openly. Then corruption can’t hide” (see https://www.transparency.org/topic/detail/public_procurement). The Economist writes that when “governments are corrupt ... sunlight is often the best disinfectant” (The Economist, ‘Read Cables and Red Faces’, December 2, 2010).

²By this definition corruption is not necessarily illegal. That distinction is crucial because corruption often occurs in the space between the letter of the law and its intent. Notably, the form of corruption we study is technically legal even though it contravenes the spirit of the public program entrusted to local politicians. Corruption has been defined in a number of ways in the existing literature, although the definition we use tends to be the most common (see e.g. Svensson (2005)). Other definitions of corruption, e.g. the “breaking of a rule by a bureaucrat (or an elected official) for private gain” in Banerjee et al. (2012), automatically lead to different classifications of actions as corrupt or not corrupt.

³See e.g. Ferraz and Finan (2008); Campante and Do (2014); Reinikka and Svensson (2004); Olken (2007); Bertrand et al. (2007). Aidt (2003); Bardhan (1997); Svensson (2005) provide an overview of the literature.

⁴While the goal of the program was to improve local development through public-works projects in addition to creating employment, in practice the scheme focuses mostly on drought-proofing measures rather than on infrastructure improvement. See e.g. Ministry of Rural Development (2010) for a category-wise breakdown of projects.

In addition to a suitable context, we need access to detailed information on election outcomes and corruption. We scrape election records from the website of the state election commission to form a list of election returns for candidates competing in thousands of village council presidency elections. To be able to measure whether corruption occurs, we need information on job allocations for the election candidates themselves as well as for typical villagers. This requires a close to complete dataset of rural households in Uttarakhand. We exploit the fact that the official program website makes information on all employment spells available on their public homepage. Scraping millions of these reports for the over 90 percent of rural households in Uttarakhand that have a job card, making them eligible to work under the program, allows us to form person-level administrative records of job allocations.⁵ We then create a crosswalk between the employment and election datasets by matching the candidates' records using their name and the name of their closest male relative. The result is a unique dataset that lets us test for whether winners, who make the key decision in allocating benefits on behalf of the central government, receive more jobs than candidates who lose.

Figure 1 shows that self-dealing is obvious to anyone who visits the website, which is public. The left part of the figure shows the background information available for the household of the elected politician on the top, which identifies the location of the household down to the village level and lists all household members by name. Below that information, the website provides employment and wage details on all job spells under the program. The right-hand side of the figure shows the analogous information for the runner-up, who in this case lost the election by three votes. Figure 1 shows that the household of the council president has received dozens of days of labor, whereas the runner-up has received no jobs at all. The disparity would be obvious to any voter who visits the website.

But by itself a disparity in allocations could arise for many reasons other than corrupt self-dealing. Citizens who rely heavily on the program may be more likely to vigorously seek office because they have the highest stake in its success. A less benign alternative is that presidents—especially those who win uncontested or landslide elections—may be wealthy villagers whose socioeconomic power lets them extract program benefits even if not in office, or renders them unaccountable to voters even while in office.

We mitigate these threats to validity by comparing labor allocations between winners and runners-up in close elections decided by a few votes. Our regression discontinuity design ensures winning and losing candidates have similar observable and unobservable characteristics. By restricting attention to close elections we also exclude villages where elite capture or non-existent political opposition has rendered the president unaccountable to voters.

We find overwhelming evidence of corruption. Winners of close elections receive nearly 3 times as many days of labor as losers. The result does not seem to be driven by punishment of the loser by the winner. Losers receive roughly the same allocation as the typical household, and much the same allocation as they received in the year before the election. Instead the difference

⁵Households can be registered for the program without ever having worked on it.

Figure 1

Won by 3 votes

Job card				
MAHATMA GANDHI NATIONAL RURAL EMPLOYMENT GUARANTEE ACT				
Job card No.:	UT: [redacted] Family-Id: 82			
Name of Head of Household:	[redacted]			
Name of Father/Husband:	[redacted]			
Category:	OTH			
Date of Registration:	1/8/2008			
Address:	[redacted]			
Villages:	[redacted]			
Panchayat:	[redacted]			
Block:	BHAISIACHHANA			
District:	ALMORA(उत्तराखण्ड)			
	NO Family-Id: 82			
Epic No.:				
Details of the Applicants of the household willing to work				
S.No	Name of Applicant	Gender	Age	Bank/Postoffice
1	[redacted]	Male	33	District Co-operative Bank
2	[redacted]	Female	30	UTTRANCHAL GRAMIN BANK
Signature/Thumb impression of Applicant		Seal & Signature of Registering Authority		

Lost by 3 votes

Job card				
MAHATMA GANDHI NATIONAL RURAL EMPLOYMENT GUARANTEE ACT				
Job card No.:	UT: [redacted] Family-Id: 14			
Name of Head of Household:	[redacted]			
Name of Father/Husband:	[redacted]			
Category:	OTH			
Date of Registration:	1/8/2008			
Address:	[redacted]			
Villages:	[redacted]			
Panchayat:	[redacted]			
Block:	BHAISIACHHANA			
District:	ALMORA(उत्तराखण्ड)			
	NO Family-Id: 14			
Epic No.:				
Details of the Applicants of the household willing to work				
S.No	Name of Applicant	Gender	Age	Bank/Postoffice
1	[redacted]	Male	35	
2	[redacted]	Female	30	
Signature/Thumb impression of Applicant		Seal & Signature of Registering Authority		

Period and Work on which Employment Given

S.No	Name of Applicant	Month & Date from which employment requested	No of Days	Work Name	MSR Total No.	Amount Due of Work Done	Payment
1	[redacted]	21/02/2015	14	[redacted] Chetadangi se khande mandir tak marg nirman 1.0	645	2184	0
Sub Total FY 1415					14	2184	0
2	[redacted]	25/08/2015	14	[redacted] harju mandir se devithan tak marg nirman karya 1.0	178	2254	0
3	[redacted]	03/12/2015	14	Anganwadi/Other Rural Infrastructure BHAISIACHHANA	404	2254	0
4	[redacted]	30/12/2015	14	Anganwadi/Other Rural Infrastructure BHAISIACHHANA	496	2254	0
Sub Total FY 1516					42	6762	0
5	[redacted]	03/08/2016	14	Anganwadi/Other Rural Infrastructure BHAISIACHHANA	439	2436	0
6	[redacted]	03/08/2016	14	Anganwadi/Other Rural Infrastructure BHAISIACHHANA	439	2436	0
7	[redacted]	23/08/2016	14	Anganwadi/Other Rural Infrastructure BHAISIACHHANA	522	2436	0
8	[redacted]	23/08/2016	14	Anganwadi/Other Rural Infrastructure BHAISIACHHANA	522	2436	0
Sub Total					22	8744	0

Period and Work on which Employment Given

Note: From the official NREGS website at nrega.nic.in.

is entirely explained by an increase in allocations to the winner. The winner's excess payouts sum to 6000 rupees in a year, roughly triple the payouts to the average household.

The interpretation of these results as open corruption rests on the assumption that self-dealing in this context is visible and punishable by voters. To explore the validity of this assumption and to test alternative explanations, we supplement the administrative data by running a survey of council presidents specifically designed to learn more about their decision-making process. We ask each incumbent how they were elected and how they and other presidents in their block have administered the scheme. Crucially, the respondents did not know we had access to their online records, giving them no reason to believe they were being monitored and no way to guess our research question. Used in tandem with census records and other surveys, these new sources of data give us an unusually clear means of understanding why corruption persists.

Drawing on our survey and the administrative data, we show that there is no evidence to suggest our results are driven by imperfect information or weak enforcement. Most presidents report that NREGS allocations are common knowledge among villagers, that villagers periodically check the paper trail of NREGS allocations, and that villagers know about and check the website that is the source of our own data. We also show that corruption is no lower in geographically smaller villages or in villages closer to internet cafes. There is no evidence that council presidents are trying to hide their actions by taking work on projects with fewer coworkers or “phantom projects” where the president is the only worker. We also confirm that most presidents do not submit allocation decisions to the online system themselves; they rely on technical assistants who could easily reveal the allocations to villagers who cannot access the website themselves. We find no evidence that corruption is lower in villages in the same block as where an assistant is based.

Meanwhile, our survey results suggest that the overwhelming majority of council presidents believe there would be formal or informal sanctions against a council president who made unacceptable allocations. We draw on a separate household survey to show that comparable proportions of households report that it is not hard to hold local officials accountable. We also show that corruption is no lower in villages with smaller populations (where tighter social networks would make it easier to sanction the president), or in villages that are close to outside enforcers located in the district or sub-district headquarters. Finally, we show that neither caste, religion, nor political parties play any meaningful role in village politics in Uttarakhand (in contrast to many other Indian states). That makes it unlikely that presidents are able to get away with corruption by exploiting the politics of division.

Why would voters tolerate visible self-dealing if they can hold council presidents accountable for their actions? We propose a model in which the opportunity for corruption is compensation for talented candidates who must forgo a relatively attractive outside option. Talented candidates can extract more benefits for their village from higher levels of government. By making the corruption payment contingent on the total benefits received by the village, voters effectively screen for unobservable talent by making the job unattractive to those unable to create benefits.

The results of our survey support the idea that presidents view self-dealing as a form of performance pay. Nearly all presidents who answered our survey believe a good council president can generate more jobs for their village. Surprisingly, over 50 percent were willing to admit their belief that villagers would expect a president who makes more jobs or projects to take more jobs themselves. We also show that only the president’s own household gets extra labor, not other members of their extended family. This pattern is not consistent with a broader failure of accountability, but fits the idea that corruption is a means of rewarding a specific household for services rendered.

If performance pay is used to deter unskilled candidates from seeking office, and performance pay takes the form of corruption, the unconditional returns—returns in the absence of corruption—should be low. We confirm that the official wage for presidents, which is their un-

conditional monetary return, is indeed low. The median president in our sample reports earning a wage that equals less than a quarter of the median household income in rural Uttarakhand. The 6000 rupees of excess payouts per year from NREGS, though big relative to what the typical household receives, is too small to raise the president's total compensation to even half the median. Nearly three-quarters of respondents believe they would have more money if they had not become president.

Finally, suppose (as per the model) performance pay is used to reward an unobservable talent for creating jobs, and the pay takes the form of corruption. Then after netting out aggregate factors, which are likely observable and not the result of unobserved ability, we would expect that villages with higher overall NREGA allocations also have higher corruption. This prediction is especially valuable because it does not arise in a more basic model where voters tolerate corruption from candidates who are charismatic or have other compensating qualities. We show that there is a positive correlation between corruption and within-block variation in overall allocations. By itself this correlation might arise simply because having more jobs to allocate also yields more chances to steal. But we show that when the overall stock of jobs is driven by an observable aggregate shock—low rainfall, which the government compensates for by expanding the availability of jobs—there is no change in the level of corruption, exactly as the model predicts.

Our results suggest that corruption can work as a kind of performance pay in some contexts, functioning as a second-best solution to the problem of attracting skilled candidates to an otherwise unattractive job. Since both the politician and the villagers benefit, the arrangement is self-reinforcing without requiring an explicit contract. The idea that corruption can lead to a more efficient outcome has been around for a while (Huntington, 1968; Leff, 1964; Lui, 1985), but it has long been considered as a much less appealing explanation for corruption than lack of verifiability and lack of enforcement. Bardhan (1997) and Aidt (2003) state that the assumptions that these classic theoretical models have to make are too strong to be relevant for explaining real world phenomena. Papers that tried to explore any positive impacts of corruption in the last 20 years have overwhelmingly found evidence to the contrary, seemingly supporting the empirical irrelevance of a second-best mechanism (Fisman and Svensson, 2007; Méon and Sekkat, 2005; Méon and Weill, 2010; Wei, 2000).

One potential explanation for this is that existing tests were mostly done at the macro level using cross-country datasets rather than based on micro data, which does not allow a focus on contexts where other causes of corruption can be held constant.⁶ Additionally, previous attempts to test this hypothesis empirically were hampered by the fact that it is usually difficult to know whether or not an official who exploits their office for private gain is doing so with the tacit (if grudging) approval of those they serve. Our paper instead focuses on an extremely suitable local context, using massive amounts of micro data from multiple sources for the empirical

⁶An exception is Weaver (2018), who finds that the allocation of health bureaucracy jobs to the person willing to pay the highest bribe leads to higher-quality hires than hiring based on a knowledge test.

analysis. Combining our own survey with administrative and census information allows us a much clearer picture of how corruption works in practice. In contrast to the existing literature, which focuses on the relationship between bureaucrats and firms in the presence of red tape, we explore the idea of ‘efficient corruption’ in the context of a politician’s interactions with their villagers. This gives rise to the new explanation that corruption can occur as a form of performance pay.

Overall, our paper suggests that the causes of corruption are more complex, and its elimination more difficult, than previously understood. While the idea of performance pay has been explored in other areas like education or health⁷, it plays out here very differently as the (grudging) approval of corruption by villagers to make the job of a local politician attractive to qualified candidates able to generate larger benefits for the population. Eliminating corruption may therefore not even be the right objective. If the promise of corruption is what tempts competent people into politics, governments would do better to change the incentives for entering public service. As developing countries introduce more ambitious welfare programs, making sure that the local politicians with the main responsibility of implementing these schemes are capable becomes crucial for the success of economic development.

2 Theory

The standard model of political competition predicts that rent-seeking cannot arise when there is transparency and official accountability. In the jargon of the theoretical literature (see, for example, Persson and Tabellini, 2000, Section 4.3) it is assumed the actions of officials are “verifiable” and their promises are “enforceable.” Policymakers, whether explicitly or not, have this model in mind when they attempt to eliminate corruption through transparency and accountability. This section reviews the predictions of the standard model before showing how they are drastically changed if the public also cares about the unobservable ability of elected officials. When there is asymmetric information about ability, corruption can arise even when corruption can be observed and punished.

2.1 The Standard Model Predicts that with Perfect Accountability there Should Be No Open Corruption

There are two candidates A and B . Each candidate promises a platform, which is a policy $G^X \in [0, 1]$, the total program benefits $T^X \in [0, \bar{T}]$, and a level of personal rents $r^X \in \mathcal{R}$ for $X = A, B$. After the election these promises can be verified and enforced, meaning the winner will be punished if she deviates from her platform. In particular, r^X can be costlessly observed and verified (hence it is open corruption.) These two assumptions—perfect observability/verifiability of r^X and enforceability of the promise—are crucial.

⁷See e.g. Glewwe et al. (2010); Lavy (2009); Muralidharan and Sundararaman (2011).

The candidate's utility is

$$U^X = \begin{cases} W + w + r^X & \text{if winner} \\ 0 & \text{otherwise} \end{cases}$$

where w is the wage paid to officeholders and W is a non-monetary “ego payoff” from holding office.

There are N voters, each with an ideal government policy G^* . These ideal points are distributed between 0 and 1. For some distance metric d each voter gets utility

$$u = -d(G^A, G^*) + [T^A - r^A]/N$$

if candidate A wins. The utility from B winning is comparable. Voters choose whichever candidate whose platform would give the highest utility.

Let G_M^* be the ideal policy of the median voter. It is straightforward to prove that the unique Nash equilibrium of this game is that both candidates will announce the platform $(G_M^*, \bar{T}, 0)$. For any Candidate A platform $(G^A, T < \bar{T}, r^A)$, Candidate B can win with probability 1 by choosing platform (G^A, \bar{T}, r^A) and no loss in non-ego utility. Therefore, both candidates must choose $T = \bar{T}$. For any Candidate A platform $(G^A \neq G_M^*, \bar{T}, r^A)$, Candidate B can win with probability 1 by choosing platform (G_M^*, \bar{T}, r^A) , again with no loss in non-ego utility. Therefore, both candidates must choose $G = G_M^*$. And for any Candidate A platform $(G_M^*, \bar{T}, r^A > 0)$, Candidate B can win with probability 1 by choosing platform $(G_M^*, \bar{T}, r^A - \varepsilon)$ for some small $\varepsilon > 0$. Doing so would increase B 's utility by $W + w$ at a cost of only ε . For A to avoid losing with probability 1 she must choose $r^A = 0$, and B must match her.

In short, the model predicts that regardless of which candidate wins the median voter's preferred policy is enacted, benefits are maximized, and (most important for our empirical work) there will be no open corruption.

Test 1 (Perfect Accountability) *Under perfect accountability the standard model predicts that in equilibrium there will be no rents.*

As noted above the model assumes the corruption is verifiable, and that voters can enforce their leader's promise not to be corrupt. We test both assumptions at some length in Section 6.

2.2 A Model of Performance Pay: Voters Use the Prospect of Corruption to Screen for High-Ability Candidates

Suppose as before that all promises about r are verifiable and fully enforceable. But now suppose that T is an absolutely continuous random variable whose outcome depends on an observable shock $Z \in \mathfrak{R}_+$ and the president's unobservable ability $h \in \{0, h^H\}$ with $h^H > 0$:

$$T = Z + \alpha h + \varepsilon$$

where $\alpha > 0$ and ε is an unobserved mean-zero shock.

Assume that when a candidate stands for office she foregoes an outside option $\bar{U} \in \{\bar{U}^L, \bar{U}^H\}$ and that $\bar{U}^L < W + w < \bar{U}^H$, meaning high-ability candidates have better outside options. A candidate stands for office if

$$W + w + r^X \geq \bar{U}$$

Suppose candidates proposed $r^X = 0$, the equilibrium platform from the standard model. Then the winning candidate earns $W + w < \bar{U}^H$, meaning only L -type candidates run for office.

But if $\alpha h^H > \bar{U}^H - W - w$ voters prefer allowing $r^X > 0$ if the rents attract a H -type candidate. If $r^X = \bar{U}^H - W - w$ then both H - and L -type candidates run for office and each type wins with equal probability.⁸ Voters prefer this outcome to the case where only L -types run. This argument gives the most basic prediction of the Screening Model, setting it apart from the standard model:

Prediction 1 *In equilibrium there will be open corruption, i.e., $r^X > 0$.*

Yet an unconditional level of positive rents is still not the equilibrium because voters would be better off if r^X were a function of total benefits after netting out the observable aggregate component. In other words voters want for rents to behave like performance pay. This is the most important prediction of the Screening Model.

Prediction 2 *Rents are implicit compensation meant specifically for the president. They are a reward for good performance.*

The winning candidate will offer voters a “contract” that maximizes their expected payoff (subject to her participation constraint). Define r^* such that $\mathbb{E}[r^*(\varepsilon)] \leq \bar{U}^L - W - w$ but $\mathbb{E}[r^*(\alpha h^H + \varepsilon)] \geq \bar{U}^H - W - w$. One hypothetical optimum for voters would be

$$r^*(T - Z) = -(\alpha h^H - \bar{U}^H) + \alpha(T - Z) \quad (1)$$

which would drive out L -types and extract as much surplus for voters while leaving H -types indifferent between running and not running. In this equilibrium the candidate effectively pays voters a fixed sum for the right to take office and keep whatever government benefits she creates for herself.

This platform assumes candidates can afford a massive fixed payment to voters in return for their rents, which may be unrealistic. If there is a lower bound $0 \geq \bar{r} > -(\alpha h^H - \bar{U}^H)$ on the realized level of rents (a sort of ex post limited liability constraint) then (1) is infeasible. Then the H -type candidate would instead offer

$$r^*(T - Z) = \bar{r} + \frac{\bar{U}^H - \bar{r}}{\alpha h^H} \alpha(T - Z) \quad (2)$$

⁸Since ability is unobservable, both high and low types claim to be high types.

which in expectation still leaves the candidate indifferent, but also implies voters get some government benefits. Aside from the rather sensible prediction that the benefits received by households will not be constant, Equation 2 makes several more substantive predictions. Since the optimal contract must deter L -types from seeking office, $\bar{r} + W + w$ must be small. Assuming the (unobservable) ego rents are at least weakly positive, the observable monetary return $\bar{r} + w$ must be even smaller.

Prediction 3 *The unconditional pay-off to being president must be low.*

Since r^* is set to ensure candidates who run for office are only just breaking even after accounting for non-monetary W , the winning candidate must on average be *losing* money by standing for office.

Prediction 4 *The total monetary benefit of holding office for the winning candidate must be lower than what she would earn had she not become president.*

But the most distinctive prediction of Equation 2 is that r^* is increasing in $T - Z$, total benefits net of the observable aggregate shock.

Prediction 5 *Holding aggregate conditions fixed, rents are higher in places where total benefits are higher.*

One final prediction arises because equilibrium rents depend on $T - Z$ rather than T . This prediction is crucial in distinguishing the Screening model from a simpler model in which r is higher when T is higher simply because there is more to steal.

Prediction 6 *Rents are not higher in places where total benefits are higher solely because of higher observable aggregate conditions.*

Performance pay is not the only model that would predict open corruption (Prediction 1). The most straightforward alternative is a simple model of probabilistic voting where voters may be willing to tolerate rent-seeking if the candidate is charismatic or ideologically suitable (see Appendix A.1 for a formal version of this model). That is why the other predictions, which do not arise in the alternative, are crucial. Predictions 2, 5, and 6 in particular are inconsistent with a model in which the candidate's personal appeal grants them license to extract rents.

3 Background

3.1 Uttarakhand and Village Council Elections

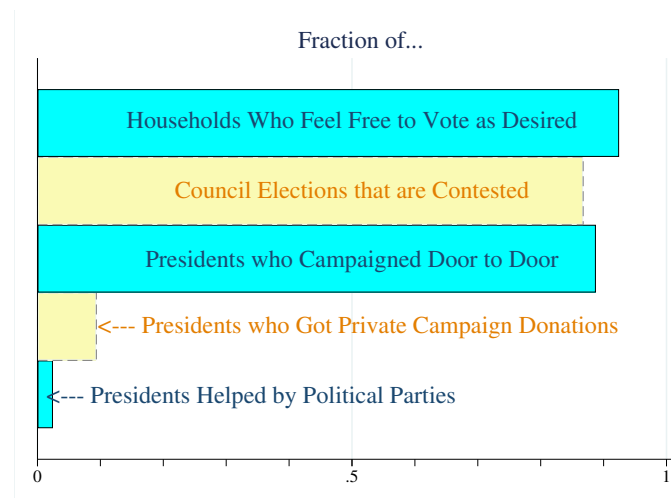
Uttarakhand is a north Indian state with a population of about 10 million people. 86 percent of its area is mountainous, and 65 percent are covered by forest. About 70 percent of the population lives in rural areas, and agriculture continues to be one of the most important industries.⁹

⁹While Uttarakhand has the 6th highest GDP per capita among Indian states, there is a large disparity between the wealthier plains and the poorer hills region, where non-agricultural employment opportunities are scarce and out-migration rates are high.

As in other Indian states, Uttarakhand is divided into districts, which are further sub-divided into blocks and contain village councils (gram panchayats), which form the lowest tier of elected government institutions. Importantly for our analysis, the president of the village council, the *pradhan*, is determined directly through local elections.¹⁰

Elections for village council presidents are held every five years, with the most recent election taking place in 2014.¹¹ Local elections are organized by the State Election Commission of Uttarakhand. The Election Commission is an independent government organization that sets the election date, and monitors the nomination process and the election campaigns of political candidates.¹² It also oversees the voting on election day and the counting of votes.¹³

Figure 2



Note: From the household module of the 2006–2008 Rural Economic Development Survey.

Voters widely believe elections to be secret and competitive: Figure 2 plots the fraction of respondents in the 2006-2008 Rural Economic Development Survey who believe that households are free to vote as they desire and that council elections are contested. For both questions, around 90 percent of individuals agree with these statements. In a survey of village council presidents we conducted among 207 officeholders in Uttarakhand, we also asked elected presidents about their behavior during the election campaign. Figure 2 shows that close to 90 percent of respondents report having campaigned door to door before their election, but only few report

¹⁰In line with their proportion among the state's population, seats are reserved for low-caste individuals, Scheduled Castes (SCs) and Scheduled Tribes (STs), and 50 percent of seats are reserved for women.

¹¹The election was held in three phases on June 18, 21 and 24, as is common in India to ensure a smooth operation and the safety of voters on election day. Votes were counted after all election phases had been completed, and the results were announced on June 27. Since Uttarakhand was heavily affected by a large-scale flood, this election was uncharacteristically held six years after the previous election from 2008. One district, Haridwar, votes on a different cycle and held elections in 2015. We exclude Haridwar from our analysis.

¹²The whole election process typically works very smoothly. See e.g. Banerjee (2014) for a detailed description of the process for the much higher stakes general elections, much of which is very similar to the local election process.

¹³The Election Commission of India, which the state election commissions belong to, is regarded as an objective, non-partisan body and is regularly named India's most trusted institution in surveys (CSDS, 2009).

receiving private campaign donations or help from political parties.

Caste does not play the same important role for voting behavior in Uttarakhand that it plays in other Indian states. While the state is ethnically diverse, it has the highest proportion of Brahmins among all Indian states at over 20 percent, and the upper-caste Thakurs make up another 35 percent of the population. 19 percent of Uttarakhandis are Scheduled Castes (SC), and 3 percent belong to the Scheduled Tribes (ST). In contrast to other states, only about 5 percent of the population are members of the Other Backward Classes (OBC). There are very few influential politicians from the Scheduled Caste or Muslim communities, and there have not been large attempts to create a unified SC-Muslim identity.¹⁴

3.2 National Rural Employment Guarantee Scheme

The village council and the *pradhan* play a key role in the implementation of NREGS. NREGS, the National Rural Employment Guarantee Scheme, is the world's largest public-works program. It is based on the National Rural Employment Guarantee Act (NREGA), which was passed in Indian Parliament in 2005. NREGS was phased in between 2006 and 2008, and now operates in all rural districts. The law guarantees every rural household up to 100 days of public employment per year at the minimum wage.¹⁵ Employment opportunities are supposed to be created anytime during the year based on demand by workers.¹⁶

The primary goal of the scheme is to provide a flexible safety net for rural households in time of need by offering an income transfer conditional on the willingness to perform manual labor at the minimum wage (Zimmermann, 2017). There are no further means tests (Dey et al., 2006; Government of India, 2009). While the program was also meant to improve local development through the public-works projects, in practice most projects focus on routine tasks, such as clearing bushes or digging holes, that can be easily carried out without the technical knowledge required for more ambitious projects like the building of an all-weather road.¹⁷

While the central government pays for the scheme, local governments take on the main responsibility for its implementation. According to the law, public-works projects are developed on the basis of recommendations by villagers during village meetings (*gram sabha*) to ensure that projects improve local development, and the proposals are then sent to block and district level officials for approval and monitoring. The *gram panchayat* initially registers households and issues them a job card that makes them eligible to apply for NREGS jobs. A worker who

¹⁴This is attributed to the fact that the SC sub-castes in Uttarakhand do not want to identify as SCs and have therefore not developed a unifying SC identity, as well as to the low proportion of OBCs in Uttarakhand. The salience of caste in other states is usually driven by conflicts between OBCs and SCs (The Indian Express, 'Uttarakhand elections: Across the border; next door to UP, new caste calculus', February 15, 2017). Over 80 percent of Uttarakhandis are Hindu according to the 2011 Census, followed by about 14 percent Muslims.

¹⁵After a large flood in 2013, the maximum employment days under NREGS was temporarily increased to 150 days (The Economic Times, 'Government mulls to raise number of days under NREGA scheme to 150', July 14, 2014). In practice, very few households exhaust or exceed the maximum permissible number of days, however.

¹⁶See Berg et al. (2018), Imbert and Papp (2015) and Zimmermann (2017) for analyses of the economic impacts of the program.

¹⁷See e.g. Ministry of Rural Development (2010) for a category-wise breakdown of projects.

wants to take up NREGS applies at the gram panchayat, and is issued a dated receipt for their application. Employment needs to be provided within 15 days, typically within a 5 km radius around the village.¹⁸ If employment cannot be provided within this time frame, the worker becomes eligible for unemployment compensation. At least one third of all workers are supposed to be women, and the law prohibits the use of contractors and machines to carry out the public-works projects. In addition to the implementation of the work scheme, the gram panchayat is responsible for keeping records on employment spells, wage payments and material expenditures, which are consolidated and monitored at the block and district level. They are supposed to be audited regularly by the gram sabha, but are also uploaded to a publicly accessible NREGS website, which allows verification by beneficiaries, NGOs and other stakeholders in close to real time (Government of India, 2009).

Despite the detailed provisions of the National Rural Employment Guarantee Act, the implementation of the program is in practice supply- rather than demand-driven: In Uttarakhand as well as in other Indian states, excess demand for NREGS jobs is common. Households can only get employment when it is made available, rather than taking up work when they may need it most (Dutta et al., 2012; Mukhopadhyay et al., 2015; Singh and Nauriyal, 2009). Many households report having to wait passively for jobs to be provided rather than actively applying for work, for example. In our dataset of millions of rural households in Uttarakhand, we find virtually no cases in which a household member had applied for work but not been offered employment, suggesting a similar pattern where applications are only recorded when employment is available. Our empirical analysis focuses on 2015, which was a drought year in Uttarakhand. True demand for NREGS was therefore plausibly much higher than normal, yet very few households come close to the 100 day limit. This implies substantial excess demand for NREGS jobs during our study period.

The necessary rationing of employment due to excess demand gives village council presidents a key role in the allocation of jobs among villagers: Mukhopadhyay et al. (2015), for example, find that village councils in Rajasthan that contain multiple villages allocate NREGS work unevenly, with more NREGS jobs going to the village council president's own village.¹⁹

In the early days of NREGS implementation, another large concern was widespread off-the-record corruption (Afridi and Iversen, 2014; Niehaus and Sukhtankar, 2013a,b), for example because minimum wage increases were not passed through to workers. In response, the Indian government opened bank accounts for NREGS beneficiaries and started to directly transfer wages for completed work into those accounts. This is designed to reduce corruption by cutting out middlemen and by increasing the bargaining power of workers. Additionally, job cards are now linked directly to individual's aadhar numbers, a kind of social security number that relies on biometric information. These changes have been shown to improve household benefits

¹⁸Work outside this radius leads to a wage increase to account for transportation costs.

¹⁹See Singh and Nauriyal (2009) and Mathur (2016) as well as the Appendix for additional information about NREGS in Uttarakhand. Zimmermann (2018) finds that NREGS also had impacts on general election outcomes depending on the length of program exposure and its implementation quality.

from the program, plausibly by making personal corruption off-the-record through made-up work spells or underpayment of wages more difficult (Muralidharan et al., 2016).

The government has also introduced additional administrative safeguards that increase the effort required for off-the-record corruption. All NREGS related information has to be entered into a software application called NREGASoft. The system contains multiple modules to track different aspects of the scheme, such as employment demanded by workers and jobs allocated, proposed and approved works projects as well as fund and labor budget management modules (Government of India, 2013). The system contains a couple of automatic safeguards and alerts: Unless the maximum of 100 days is relaxed by the state government, for example, a household cannot be allocated more than 100 days of work in the system. The proper sequence of steps of the employment process needs to be kept to be able to enter the corresponding information.²⁰

4 Data and Research Design

4.1 Data

We use publicly available administrative data on NREGS employment that we scraped from the official NREGS website, which is maintained by the Government of India. The dataset contains digital versions of the paper trail that is mandated by the scheme, which provides us with data on NREGS employment at a highly disaggregated level. Every registered job card has an online record with the details of the job card holder, typically the household head, and his or her family members. The household's district, block, panchayat, and village are recorded. The record also includes the name, gender, and age of every household member as well as every person's exact employment dates, wages paid, and the name of the project they worked on.²¹ Additionally, we have information on the name of the household head's father or husband, the household's broad caste category, and the date of initial registration for the job card that made the household eligible to work under NREGS.

The administrative dataset therefore contains daily information on job spells down to the village level. The fine temporal and spatial disaggregation is crucial for our analysis, since it allows us to match NREGS employment to gram panchayat elections and to study whether newly

²⁰Work cannot be allocated without a demand for employment registered in the system, for example. Muster rolls can only be generated after work has been allocated, and no expenditures can be recorded for a project that is marked as completed. The system also checks that the paid wage is not higher than the notified MGNREGA wage rate, and that a worker is not employed on more than one project in the same time period. Projects have to be marked as approved in the system before they can be implemented, and measurement books that are the foundation for wage payments can only be filled out for activities that have been approved and where a technical estimate exists in the system. The system automatically creates alerts for project and wage payment delays, projects with exploding costs of more than 10 percent of the original cost (Government of India, 2013). Please see Appendix for additional details.

²¹While the job card also records the exact dates of every employment request and employment offer in addition to the actual employment dates, in practice this information only rarely differs from the actual employment dates. This supports existing qualitative and quantitative research that documents that most gram panchayats in practice do not allow households to request employment when no employment can be provided (Dutta et al., 2012; Mathur, 2016). This process ensures that unemployment compensation is not paid out.

elected pradhans systematically allocate more resources to themselves or their family. We use publicly available information from the last local election for the pradhan from June 2014. The election dataset contains information on name and vote count of the winner and runner-up of each gram panchayat election. We also know the reservation status of each panchayat with respect to caste and gender, as well as the name of a candidate's father or husband. This information allows us to match the winner and runner-up of the elections to their NREGS job card profile. Since surnames in Uttarakhand are often missing or, if provided, are very common, information on the husband's or father's name is crucial to ensure a correct match. We drop any cases in which there is no unique match.

To help us test whether our results arise because voters do not know the NREGS allocations or cannot punish the pradhan, we link this dataset to the 2011 Indian Census. We collapse the census data, which is measured at the level of the census village, to the level of the panchayat. We merge the panchayat-level data to our linked job card-election dataset. To this dataset we add data on whether there is one or more Gram Rozgar Sahayak (GRS, village technical assistant) in the sub-district. These data come from the list of NREGS employees posted on the same website from which we scrape the job card data.

To get direct evidence for why corruption persists we ran a phone survey of pradhans in our sample. We matched the sample of winning candidates in our sample to contact information posted on the website of the Uttarakhand Ministry of Panchayati Raj. We assigned a random ordering to this sample and hired contractors in India to work down the list making calls in the month just before the 2018 monsoon season. The contractors made as many calls as possible in this period, yielding a final sample of 207 complete or partial interviews.²² The response rate was roughly 30 percent, where nonresponse arose mainly because our interviewer could not connect (likely because the phone was off or out of cell phone range). Conditional on someone picking up the response rate was close to 100 percent. The connection issues seem random—several of those who could not be initially contacted were successfully interviewed when called later. We detect no statistically significant difference on observables between our survey sample and the pradhans who were not surveyed, making differential non-response less likely to be a concern.

Table 1 reports summary statistics for three samples: all candidates that were successfully matched to their NREGS records, the subset within the bandwidth used to estimate our main specification (see below), and the set of pradhans in our survey sample. The samples are broadly similar on all characteristics except those that differ by construction (e.g. all candidates in our survey sample were elected pradhans and by construction had a positive vote margin). As noted above there are no significant differences between the survey sample and the unsurveyed pradhans in the matched sample.

²²During the first phase of the survey we had to modify the wording of some questions after our interviewers reported that respondents did not understand the original wording. As a result we do not have 207 responses for some questions.

Table 1
Descriptive Statistics and Sample Sizes

	Full Matched Sample	In Bandwidth	Surveyed
Winner	0.54 (0.50)	0.44 (0.50)	1.00 (0.00)
Female	0.47 (0.50)	0.47 (0.50)	0.43 (0.50)
Scheduled Caste/Tribe	0.21 (0.40)	0.21 (0.41)	0.21 (0.41)
Vote Margin	0.85 (19.77)	-4.57 (16.64)	14.65 (14.37)
In Bandwidth	0.82 (0.39)	1.00 (0.00)	0.65 (0.48)
Surveyed	0.13 (0.33)	0.10 (0.30)	1.00 (0.00)
Days of labor (2015)	40.10 (40.66)	36.30 (38.65)	57.40 (39.00)
Days of labor (2013)	23.13 (34.55)	23.95 (35.13)	26.59 (37.71)
Observations	1650	1351	207
Panchayats	1148	1003	207

4.2 Research Design

Our empirical estimation strategy uses a regression-discontinuity (RD) design, exploiting close elections. We restrict our sample to the winner and runner-up in each election. Let i be one of these two candidates in the election for panchayat p . Our running variable is the vote margin, which we define as

$$[Margin]_{ip} = \begin{cases} [\text{Winner Votes}] - [\text{Runner-Up Votes}] & \text{if } i \text{ won election in } p \\ -([\text{Winner Votes}] - [\text{Runner-Up Votes}]) & \text{if } i \text{ lost election in } p \end{cases}$$

This definition generates a discontinuity at zero.²³ For our research strategy to identify a causal effect, winners of close elections need to be credibly determined randomly, for example through a breaking of ties or by the weather on election day affecting turnout. We therefore zoom in on a small window around the cutoff.

The assumption of as good as randomly determined winners implies that political candidates standing for election should not be able to perfectly manipulate the number of votes they receive. To test this, we conduct a series of placebo tests using baseline data and outcomes that should not be affected by a close election.

We estimate:

$$[Outcome]_{ip} = \pi_0 + \pi_1 [Margin]_{ip} + \pi_2 [Margin]_{ip} \times [Win]_{ip} + \beta [Win]_{ip} + \nu_{ip} \quad (3)$$

where $[Win]_{ip}$ is a dummy for whether $[Margin]_{ip} > 0$ and $[Margin]_{ip}$ is restricted within a bandwidth centered on 0. We use the method suggested in Calonico et al. (2014) to choose the op-

²³In practice, the official election law for Uttarakhand breaks ties by randomly drawing the name of the winner among candidates with the same number of votes and then adding a vote to the winner's vote count in the election records.

timal bandwidth for our main specification, but also explore the robustness of our results to a wide range of alternative bandwidths.

We also test for heterogeneity—whether the discontinuity is larger or smaller in certain panchayats. Let $[Het]_p$ be a dummy for whether p satisfies some criterion. We estimate

$$\begin{aligned} [Outcome]_{ip} = & \pi_0^M + \pi_1^M [Margin]_{ip} + \pi_2^M [Margin]_{ip} \times [Win]_{ip} + \beta^M [Win]_{ip} \\ & + [Het]_p \times (\pi_0^H + \pi_1^H [Margin]_{ip} + \pi_2^H [Margin]_{ip} \times [Win]_{ip} + \beta^H [Win]_{ip}) \\ & + \nu_{ip} \end{aligned} \quad (4)$$

and test for whether $\beta^H \neq 0$, which is evidence in favor of heterogeneity.

Finally, in one specification we simultaneously estimate the size of the discontinuity for both candidates and members of their extended family. Suppose the sample is expanded beyond the households of candidates to now include households in the extended families of candidates. Let $[Cand.]_p$ be a dummy for whether the household contains a candidate, and $[Fam.]_p$ a dummy for households in the extended family (defined as having the same father or husband as the candidate). We estimate

$$\begin{aligned} [Outcome]_{ip} = & [Cand.]_p \times (\pi_0^C + \pi_1^C [Margin]_{ip} + \pi_2^C [Margin]_{ip} \times [Win]_{ip} + \beta^C [Win]_{ip}) \\ & + [Fam.]_p \times (\pi_0^F + \pi_1^F [Margin]_{ip} + \pi_2^F [Margin]_{ip} \times [Win]_{ip} + \beta^F [Win]_{ip}) \\ & + \nu_{ip} \end{aligned} \quad (5)$$

and test for whether $\beta^F > 0$. In all specifications we cluster standard errors by panchayat.

5 Main Results: There Is Open Corruption

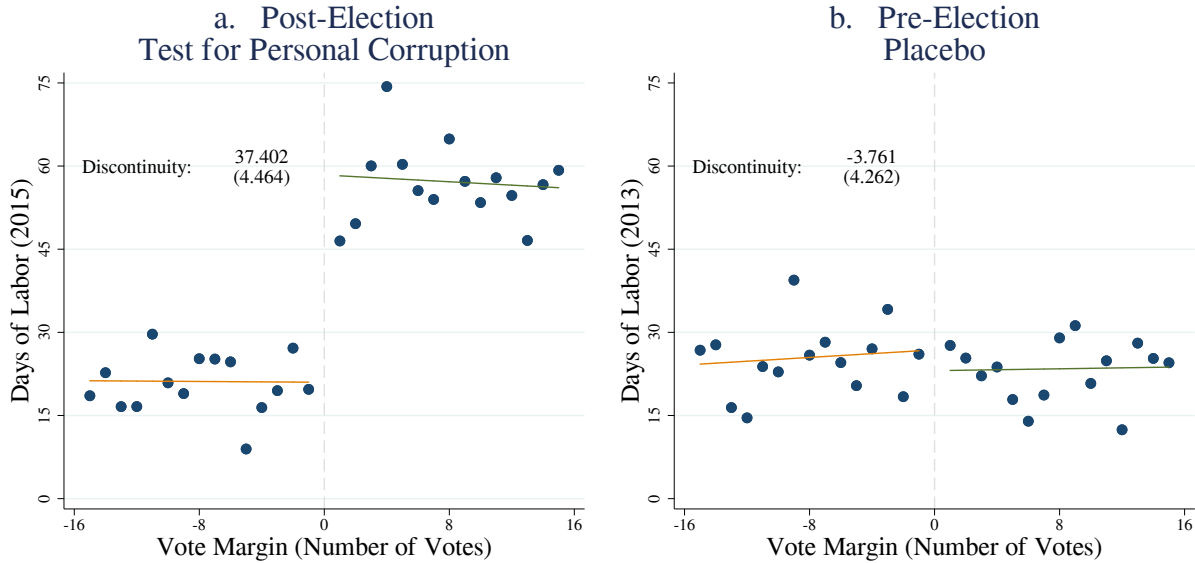
We run Test 1, that there should be no open corruption, by estimating Equation 3 on candidates whose vote margin is within a bandwidth of 15 votes.²⁴ As the election was in mid-2014 we test for a discontinuity in the total days of labor allocated to the household of the candidate in 2015. The left-hand panel of Figure 3 shows the regression line of best fit alongside the average days of labor earned by households whose candidate had each possible winning margin. The figure shows a large discontinuity when the margin switches from negative to positive, when a candidate switches from barely losing to barely winning. The winner receives an extra 37 days of labor—nearly 3 times as many as the loser—suggesting she heavily favors her own household over others.

Panel A of Table 2 shows this estimate (in Column 1) together with several robustness checks. In some panchayats we were unable to match both the winner and runner-up to their job card record. These observations are included in the main specification, but in Column 2 we verify that the result is robust to including only panchayats for which we are able to match both candidates. As noted in Section 4.2 we generally define the running variable as the margin of votes in levels.

²⁴Unless otherwise specified we use this same bandwidth as we test other outcomes or specifications to avoid conflating the effect of changing specifications with the effect of changing the bandwidth. But the results are qualitatively similar when we vary the bandwidth.

Figure 3

Winners of Close Elections Receive 3 Times as Much Labor



Note: Standard errors are clustered by panchayat.

Column 3 verifies that defining the margin as a proportion of all votes cast does not qualitatively change the results.²⁵

Our main result shows that the winner of the election gets more days of labor than the loser, but is it possible the difference arises only because the loser is given fewer days of labor than other households? Though punishing a political rival is clearly misconduct, it would not strictly meet our definition of corruption (using public office for private benefit), and might be less visible than if the winner earns more labor than most other households. In jargon the question is whether the Stable Unit Treatment Value Assumption is violated. We test for a violation by reassigning every *winning* candidate the number of days earned by the average household in the panchayat (excluding both winner and loser). If our estimates are driven by harm to the loser rather than benefit to the winner, this estimate should be similar to the estimate in Column 1. But Column 4 shows that the estimate is close to zero, suggesting losers are treated no differently than the typical household.

Columns 5—7 estimate Equation 3 for other outcomes. Column 5 shows that winners receive 3 more jobs than losers (who receive 2). Column 6 shows that winners are 37 percentage points more likely to have gotten a job at all in 2015. Column 7 shows that their NREGS earnings are nearly 6000 rupees higher on average—a difference of nearly two-thirds the median official salary reported in our survey of council presidents.

We then test the key assumption behind the regression discontinuity design, that at the time

²⁵Since this new running variable is on a completely different scale we resort to the optimal bandwidth chosen by the method of Calonico et al. (2014).

Table 2
Main Results: Test of Prediction 1 (Open Corruption)

Panel A: Main Results							
	Days of Labor				Other Outcomes		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Main Spec.	Dual Matches	Vote Share as RV	Test: SUTVA	# of Jobs	Any Job?	Earnings
RD Estimate	37.402*** (4.464)	39.935*** (5.635)	24.781*** (6.777)	-0.043 (2.736)	3.305*** (0.419)	0.373*** (0.053)	5957.528*** (708.960)
Outcome at Disc.	20.99	21.17	23.90	20.99	1.97	0.54	3333.89
Observations	1105	696	400	1105	1105	1105	1105
Panchayats	757	348	283	757	757	757	757

Panel B: Placebo and Specification Tests						
	(1)	(2)	(3)	(4)	(5)	(6)
	Labor (2013)	SCT Cand.	Female Cand.	Name Length	Name Length (M. Rel.)	Matched?
RD Estimate	-3.761 (4.262)	0.012 (0.042)	0.010 (0.044)	-0.287 (0.312)	0.216 (0.409)	0.028 (0.032)
Outcome at Disc.	26.85	0.18	0.47	10.46	8.61	0.32
Observations	1105	1105	1105	1105	1105	2400
Panchayats	757	757	757	757	757	1200

Panel C: Robustness to Bandwidth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$h = 25$	$h = 22.5$	$h = 20$	$h = 17.5$	$h = 15$	$h = 12.5$	$h = 10$	$h = 7.5$
RD Estimate	36.565*** (3.519)	36.094*** (3.791)	34.875*** (3.954)	36.583*** (4.186)	37.402*** (4.464)	37.615*** (5.088)	36.110*** (5.386)	32.689*** (6.625)
Outcome at Disc.	22.13	21.10	20.99	20.89	20.99	19.73	20.22	20.24
Observations	1467	1380	1336	1216	1105	898	752	472
Panchayats	1009	949	916	834	757	623	518	331

Note: "Outcome at Disc." gives the estimate of the counterfactual outcome at the cutoff in the absence of treatment (that is, the left limit at the cutoff). Standard errors are clustered by panchayat.

of the election candidate households just below the cutoff were similar to those just above in all ways except that they lost the election. Like much of the literature we test the assumption by testing for discontinuities in pre-determined outcomes. Since the election was in 2014, winning or losing should not affect outcomes determined before 2014—for example, the number of days of labor allocated in 2013. Any discontinuity would suggest the type of household that received more labor in 2013 was able to sort itself onto the winning side of the cutoff (say, by manipulating the vote count).

The right-hand panel of Figure 3 estimates Equation 3 in exactly the same way as was done to construct the left-hand panel, but using the 2013 days of labor. There is no sign of a discontinuity. Columns 1—5 of Table 2.B report applying the same procedure to several other pre-determined outcomes. Column 1 is the same as Panel B of Figure 3. Column 2 tests for differences in whether the winner is a member of a scheduled caste or tribe (SCT), both historically disadvantaged groups. Column 3 tests for whether the winner is more or less likely to be a woman. Ideally we would also test other measures of income or social status, but the job card data are relatively sparse. One very rough measure of social status is the length of the candidate's name, as higher caste candidates are likely to have a last name based on their caste (e.g.

Kabadwal) whereas lower caste candidates tend to have “default” names that hide their caste (e.g. Devi). Columns 4 and 5 test for differences in the length of the winner’s own name and that of the closest male relative (husband or father). None of these placebo tests show a difference that is statistically or economically significant.

One other concern is that it may be systematically easier to make a match between the election records and the job card data for winners. That is especially a concern if losers are less likely to get a NREGS job card, without which they would not even appear in the job card data. We test for whether there is a discontinuity in the match rate by taking the full set of candidates we attempted to match, restricting to the bandwidth of our main specification, and estimating Equation 3 on a dummy for whether the candidate was matched. Reassuringly, Column 6 suggests there is no discontinuity.

Finally, we verify that the results are not sensitive to the choice of bandwidth. Table 2.C estimates Equation 3 for bandwidths ranging from as wide as 25 votes to as narrow as 7.5.²⁶ The estimates are all similar.

Is it possible there is a more innocent explanation for why the pradhan gets more days of NREGS labor than anyone else? For example, the pradhan might be supervising the projects to make sure they are completed properly, and thus needs to be on nearly every project. But each NREGS project has an official work site supervisor, the “Mate,” and thus does not need an unofficial supervisor. The Mate is supposed to be chosen based on technical expertise that most pradhans lack. Over 80 percent of pradhans who answered our survey confirm that neither they nor any member of their household has served as a mate since the election. In any case, mates are paid directly for their labor through the project budget, not through NREGS labor.

The other innocent explanation is that the pradhan is stepping in to keep work on NREGS projects continuing at times of the year when no one else needs employment. As noted in Section 3, demand for NREGS jobs generally far outstrips what is available. It is unlikely that in 2015, when Uttarakhand suffered poor rainfall, that there would be a lack of interest in NREGS labor. But we can test this hypothesis directly by checking whether pradhans take less excess labor during the season when NREGS demand tends to be highest. Not surprisingly the overwhelming majority of pradhans (83 percent) report that NREGS demand is highest during the dry season (rabi). But when we estimate Equation 3 separately on labor in the dry season and labor during the monsoon season we find very similar estimates that lie within a single standard error of one another.²⁷ There is no evidence to suggest the pradhan’s own NREGS allocation varies by season.

The results are also not driven by heterogeneity by, say, gender. One might wonder if women have inherently different preferences or if men feel less accountable because they are often prevented from seeking re-election by reservation.²⁸ But we find no evidence of lower corruption

²⁶Since the number of votes is discrete a fractional bandwidth is effectively rounded down.

²⁷For the monsoon season the discontinuity is 17.9 days with a standard error of 2.6, and for the dry season it is 16.0 with a standard error of 2.6. Regression output is available on request.

²⁸In Uttarakhand, 50 percent of pradhan positions are reserved for women.

among female pradhans. The discontinuity is of roughly equal magnitude when we re-estimate Equation 3 after restricting the sample to men or women.²⁹

6 Is there Transparency and Accountability?

The results of Section 5 are a rejection of the standard model only if two assumptions hold:

1. Villagers can actually observe NREGS allocations, and thus self-dealing is open corruption.
2. Villagers can punish corruption if they so choose.

6.1 Can Villagers Actually See the Corruption?

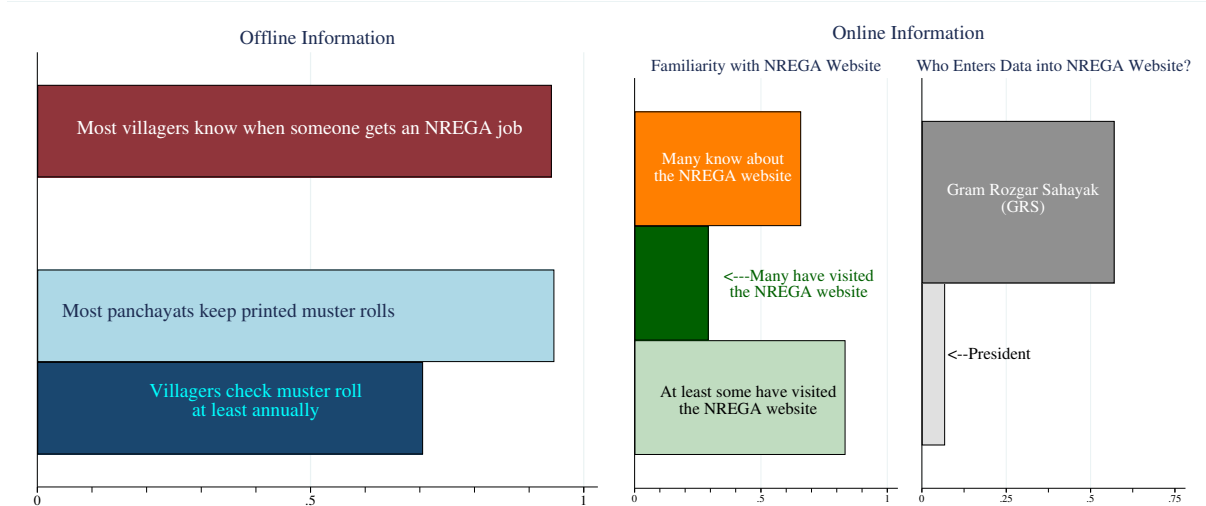
Villages are tightly knit communities, and news of NREGS allocations spreads quickly. Nearly all pradhans in our survey believe it is widely known when someone in the village receives a NREGS job (left panel of Figure 4). If the pradhan is working far more jobs than everyone else the villagers would probably know it. But is it possible that the pradhan is able to somehow avoid scrutiny?

For example, one might wonder if some panchayats are too geographically large for villagers to keep track of all the NREGS projects. We test for whether such frictions explain our results by estimating Equation 4, which lets us test for whether the discontinuity is smaller in smaller panchayats. We define dummies for whether the physical area of the panchayat lies below the median for all panchayats, and for whether the panchayat comprises a single village. Columns 1 and 2 of Table 3.A report the results. The coefficient labeled “Interaction” shows how much bigger or smaller the coefficient is in small panchayats. By neither definition of size is there any significant difference, and in both cases the coefficient is of the wrong sign. The results are similar if we instead define dummies for population density. That suggests geography is not preventing villagers from monitoring the pradhan.

But is it possible the pradhan is assigning himself jobs without actually working them? Such tricks would prevent households from directly observing how much more the pradhan receives in NREGS payments. For example, the pradhan might assign himself to projects with very few other workers (or even to projects where he is the only worker). Villagers would not be able to directly observe who gets jobs on these phantom projects. If pradhans are using this maneuver we would expect the average number of workers on projects worked on by the pradhan would be significantly lower than those worked on by the runner-up candidates in the election. We estimate Equation 3 taking the NREGS project as the unit of analysis. Among the set of projects worked on by either winner or runner-up (but not both) we assign the running variable of the candidate. Columns 3 and 4 of Table 3.A show that there is no significant discontinuity in the number of workers or in the fraction that are single-person projects (which in any case are quite rare).

²⁹Results are available upon request.

Figure 4



Note: From the survey of council presidents.

Another possibility is that the pradhan is assigning himself work on legitimate projects but simply not showing up for work and not telling anyone he was supposed to be there. In theory every panchayat is supposed to keep paper records of the official “muster rolls,” which list all the workers who have received NREGS jobs on every project. Nearly all pradhans believe most panchayats in their block keep these records, and over two-thirds of pradhans report that a villager will ask to check the rolls at least once per year (left-hand panel of Figure 4). Given that these villages are small, a single suspicious villager could make what she finds widely known with ease.

It is possible the pradhan simply doctors these records to erase his own allocations. Erasing the paper trail is no trivial task, as other panchayat officials would have to be complicit. But if the pradhan can doctor the records the ultimate remaining check is the NREGS website. A payment cannot be made without being recorded in the site. According to the survey over two-thirds of pradhans believe most of the villagers in their panchayat know about the NREGS website (see right-hand panel of Figure 4). Although few of them would say most villagers in their panchayat have actually visited the site, over 80 percent say that at least a few of their constituents have visited the site. Any visitor could hardly fail to notice that the pradhan has received many times more NREGS jobs than anyone else, and if they thought it suspicious they would likely mention it to others.

We also check directly in the data for whether panchayats with easier access to the internet have lower levels of corruption. Though at least as of the 2011 census few villagers had internet access in their own homes, internet cafes are common in India. We define a dummy for whether a panchayat has a hamlet within 10 kilometers of an internet cafe. Our estimates of Equation 4, reported in Column 5 of Table 3.A, suggest being close to an internet cafe makes no difference.

One final check on the pradhan’s authority is the Gram Rozgar Sahayak (GRS), the village

Table 3
Tests for Alternative Explanations

Panel A: Corruption-Hiding						
	Information Frictions		Hiding Effort		Access to Online Record	
	(1) One-Vil	(2) Small (Area)	(3) # Workers	(4) Solo Project	(5) Internet Cafe	(6) GRS in Block
RD Estimate:						
–Main Effect	35.190*** (5.825)	32.651*** (7.642)	3.637 (3.021)	-0.003 (0.003)	34.269*** (6.967)	38.626*** (6.643)
–Interaction	4.243 (9.013)	2.768 (11.005)			-0.662 (11.523)	-2.786 (8.920)
Outcome at Disc.	18.560	12.704	19.900	0.003	21.864	17.105
Observations	1105	685	1404	1404	685	1105
Panchayats	757	471	607	607	471	757

Panel B: Imperfect Enforcement				
	Small Population		Close to Outside Enforcement	
	(1) Votes Cast	(2) Census	(3) District HQ	(4) Sub-District HQ
RD Estimate:				
–Main Effect	37.736*** (5.971)	28.345*** (9.266)	31.071*** (7.256)	36.592*** (7.698)
–Interaction	-1.070 (8.959)	9.587 (11.658)	5.571 (10.985)	-5.434 (11.113)
Outcome at Disc.	17.252	19.956	24.448	21.108
Observations	1105	685	685	683
Panchayats	757	471	471	470

Note: “Outcome at Disc.” gives the estimate of the counterfactual outcome at the cutoff in the absence of treatment (that is, the left limit at the cutoff). Standard errors are clustered by panchayat.

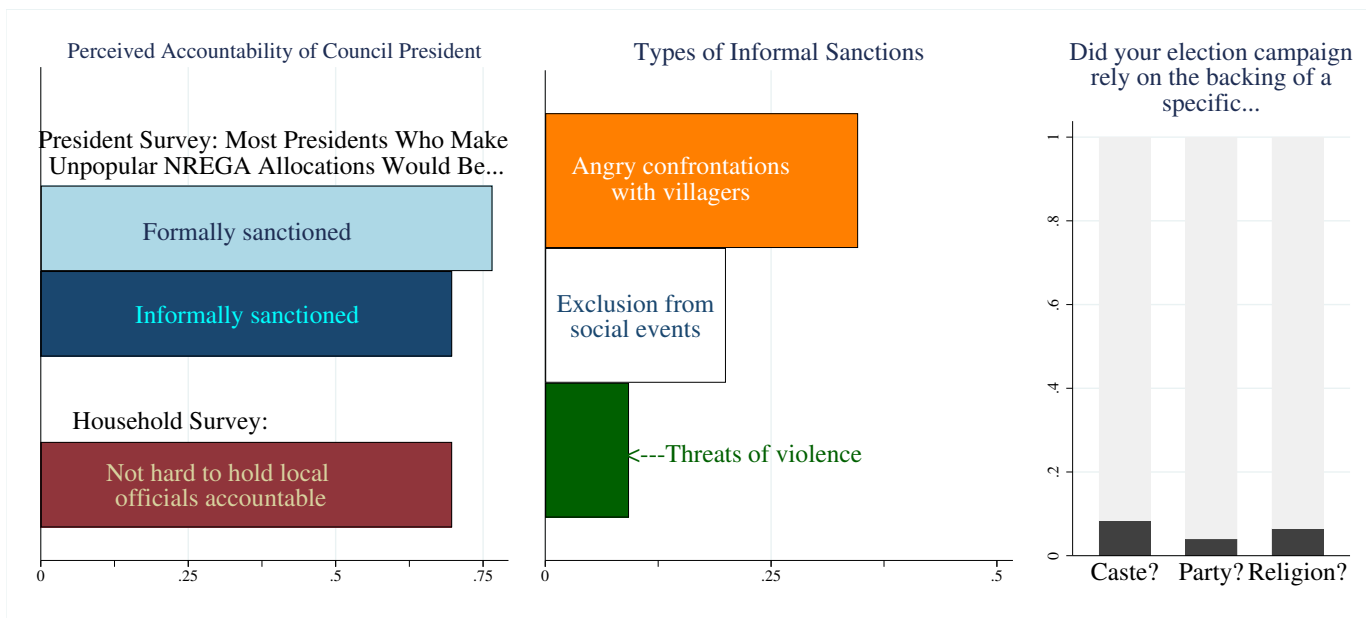
technical assistant. Though the president decides how to allocate NREGS jobs, the majority of pradhans report that the GRS actually submits those decisions to the NREGS online system, and almost no pradhans actually enter the information themselves (see right-hand panel of Figure 4).³⁰ The GRS clearly knows the pradhan is allocating more jobs to himself, and may thus serve as another check on his ability to act in secrecy. We test for whether there is significantly less corruption in panchayats located in a block where at least one GRS is based. Column 6 of Table 3.A suggests having a GRS nearby makes no significant difference in the level of corruption.

6.2 Can Villagers Punish Corruption?

The survey asked each pradhan whether a typical pradhan in their block would be formally or informally sanctioned for making NREGS allocations that are unacceptable to her constituents. The overwhelming majority said most pradhans would be sanctioned (see left-hand panel of Figure 5). When asked what types of informal sanctions were likely, the most common answers were that the pradhan would be confronted by angry villagers, suffer exclusion from social events, or

³⁰Most of the other pradhans report that the decisions are submitted by the village secretary or some other assistant.

Figure 5



Note: From the survey of council presidents and the household module of the 2006–2008 Rural Economic Development Survey.

even be threatened with violence.

Of course, the respondents might be giving what they believe to be the “correct” response. Our interviewers made it clear they were not affiliated with the government (and respondents seemed to accept that, as evidenced by their tendency to make unsolicited complaints about how the government runs NREGS). Nevertheless the respondents might feel awkward admitting that they feel unaccountable to their constituents. Relatively few pradhans reported having heard of any pradhan being sanctioned, but it is not clear whether that is because there really is no risk of sanction or because pradhans simply try to please their constituents.

But thanks to the 2006—2008 Rural Economic Development survey we also know that nearly 75 percent of households believe they can hold their local officials accountable. Though this survey was done mostly in 2008 and surveyed households from across India, there is no reason to expect that leaders are less accountable in 2015 or that the situation is worse in Uttarakhand, where the population is more homogeneous, national parties are less involved in local politics, and caste is largely irrelevant in politics. Less than 10 percent of council presidents in our sample report having relied on the support of a caste, religion, or political party in their campaign for office. That is in stark contrast to India as a whole, where the Rural Economic Development Survey reports large fractions of candidates for the council presidency report relying on a caste group for support. Although models like that of Padró i Miquel (2007) might apply well to other parts of India, in Uttarakhand there is little basis within a village for factionalism to drive voters to ignore corruption.

Leaving aside survey results, we also estimate Equation 4 to test for whether there is less

corruption in panchayats where internal or external enforcement against the *pradhan* is easier. One might imagine a small panchayat would have tighter social networks, making it easier to punish a *pradhan* who displeases the village. We have two measures of population: the total number of votes cast in the 2014 election, and the census record of the population in 2011. The first might measure the number of politically active villagers, and is known for all panchayats. The second unfortunately is only known for panchayats that we can match to the census, but can more easily be interpreted as measuring the social distance between the *pradhan* and the typical household. We define dummies for whether a panchayat falls below the median for each of these measures. Columns 1 and 2 of Table 3.B suggest that by neither measure small villages are significantly less corrupt. Though the interaction coefficient in Column 2 is large, the standard error is even larger and the coefficient has the wrong sign.

We next test for whether there is less corruption in panchayats that are close to an external enforcer. There are two higher authorities that might hear a villager's complaint, the block and district program offices. As these offices are usually located in the block and district headquarters, we define dummies for whether the panchayat's distance to each headquarter lies below the median. Columns 3 and 4 of Table 3.B suggest corruption is not significantly lower for panchayats closer to either, and the two coefficients have opposite signs. There does not seem to be any consistent evidence to suggest being close to outside enforcement matters for corruption.

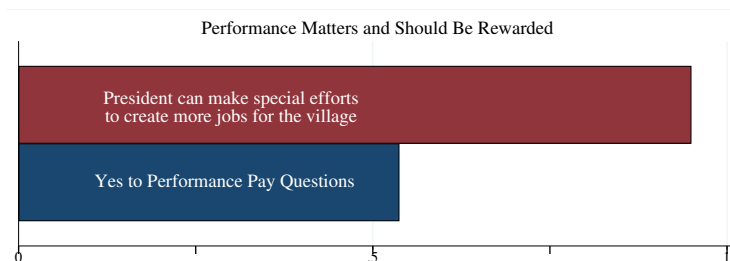
7 Mechanism: Testing the Model of Performance Pay

Since the standard model cannot explain the results of Section 5, we now test the predictions of the performance pay model in Section 2.2. Prediction 1 is simply the opposite of Test 1: there is open corruption. But there are other models that make the same prediction—in particular, a simple model of rent-seeking and probabalistic voting (see Appendix A.1). To assess whether the balance of evidence falls in favor of the performance pay model we test the other predictions from Section 2.2, which follow from the unique mechanism of the model.

7.1 Prediction 2: Corruption is Implicit Compensation for Performance

The simplest (and yet perhaps most convincing) test of Prediction 2 is to simply ask. But given that council presidents may not see their actions as corruption (and anyone would reject association with such a pejorative word), the most direct question might yield answers that are meaningless. Even questions about hypothetical situations often fail because the exact question is hard to convey and often gets muddled in translation.³¹

³¹For example, our own (university-educated) interviewers had trouble understanding a set of questions asking whether villagers would consider it “unusual” for a hypothetical council president's household to get priority in job allocations. They initially interpreted it to mean the opposite of what was being asked. Respondents had trouble grasping the hypothetical. The Hindi translation also might have been taken as a statement about how villagers would feel about the desirability rather than the normality of the situation.

Figure 6

Note: From the survey of council presidents.

Instead we rely on three questions asking directly about whether a hardworking president can create more NREGS jobs, and whether the president’s job allocation should be linked to the number of jobs created. Figure 6 reports the fraction of council presidents who answered yes to each of these questions. The top-most bar shows that nearly all presidents agree that there are “special efforts” a president “can make to bring back more jobs for their constituents.” To measure whether these efforts should be rewarded we measure whether the president answers yes to either of two “Performance Pay” questions:

Do you believe a typical person in a village in your block would agree that a Gram Pradhan who makes those efforts deserves a few more NREGS jobs than the typical household in the village?

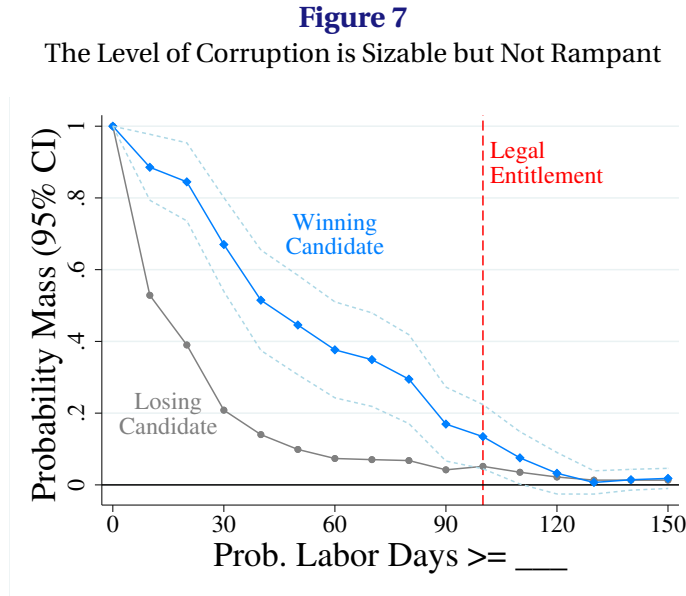
and

Suppose a Gram Pradhan in a typical village in your block manages to get a new worksite approved for his village. Would people in the village expect the Pradhan’s household to do NREGS labor on the newly approved worksite?

The bottom bar shows that a majority of council presidents agree with one or both of these statements.

We back these survey results with several objective tests for whether the allocation of NREGS jobs fit what one would expect of pay for performance. One rather basic feature of a paycheck is that it is bounded. The level of corruption should be sizable but not rampant. We test this prediction by estimating Equation 3 on a sequence of dummies for whether the number of NREGS days exceeds 0 days, 10 days, 20 days, etc. Figure 7 plots the constant and the sum of the constant and the estimated discontinuity. These are essentially estimates of the inverse cumulative distribution function for a candidate who barely loses or barely wins.

Figure 7 shows that less than half of pradhans receive more than 50 days of labor. That means most pradhans receive less than half of the amount all households are entitled to by law. Less than 20 percent receive the full amount they are due. Though they receive far more days of labor



Note: We estimate Equation 3 on a sequence of dummies for whether the number of NREGS days exceeds 0,10,20,... We plot the constant (Losing Candidate) and the sum of the constant and the estimated discontinuity (Winning Candidate). Standard errors are clustered by panchayat.

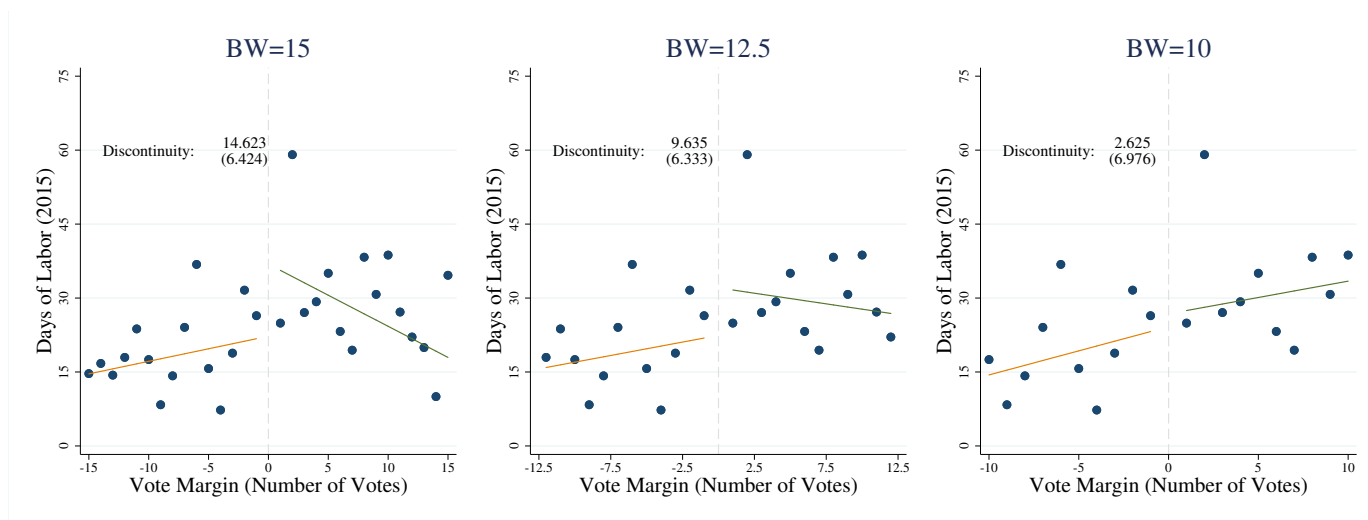
than a typical household, their total allocation looks more like a modest subsidy than a rampant theft.

If the *pradhan* is allowed to draw extra NREGS labor solely as compensation, one would not expect people outside her household—in particular, her extended family—to receive any of the largess. Family members within the household would be pooling their earnings with the *pradhan* (and might reasonably earn money by working NREGS jobs that the *pradhan* is personally too busy to take). But extended family members keep separate households and would likely keep most of their NREGS earnings for themselves. Since they are not working for voters, they should not be paid. We test this prediction by estimating Equation 5. We define the extended family as anyone in the panchayat who has the same father/closest male relative as the candidate. We assign these family members the vote margin of their contesting relative. We excluded cases where the winner and runner-up are part of the same extended family.

Figure 8 is drawn analogously to Figure 3, but showing NREGS days allocated to extended family. These estimates are more sensitive to the choice of bandwidth than our estimates from Figure 3, so we present the same regression for three different choices of bandwidth. Though at the widest bandwidth (left panel) the estimate is positive, it is clearly an artifact of a bandwidth that is too wide. The estimate shrinks to insignificance at narrower choices of bandwidth (center and right panel), and the magnitude of the estimated discontinuity shrinks to almost zero.

Table 4 shows the full estimates of Equation 5 for this range of bandwidths. They confirm that the estimates for family members shrink to insignificance while those for the candidate remain unchanged. That suggests it is only the *pradhan* who receives extra NREGS labor, not her family.

Figure 8
Extended Family Does Not Get Any Extra NREGS Labor



Note: Standard errors are clustered by panchayat.

Table 4

	(1) BW=15	(2) BW=12.5	(3) BW=10
RD Estimate:			
–Candidate	35.607*** (4.662)	35.790*** (5.382)	33.999*** (5.729)
–Family	14.623** (6.423)	9.635 (6.332)	2.625 (6.974)
Outcome at Disc.	22.257	22.430	24.180
Observations	2422	1914	1521
Panchayats	725	595	494

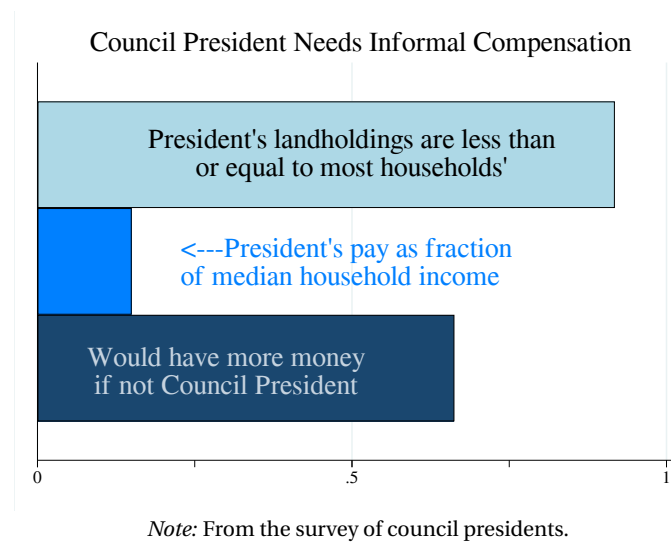
Note: “Outcome at Disc.” gives the estimate of the counterfactual outcome at the cutoff in the absence of treatment (that is, the left limit at the cutoff). Standard errors are clustered by panchayat.

7.2 Predictions 3 and 4: Unconditional Returns are Low and the Opportunity Cost is High

The next two predictions arise because the model predicts open corruption is used to screen for ability. Prediction 3 states that the unconditional returns to being president must be low. In the model the unconditional return equals the returns in the absence of corruption, which has a monetary part—the official wage—and a non-monetary part. The non-monetary part is unobservable but likely to be positive.³² That implies the observable monetary part should be even smaller.

Figure 9 shows that the median annual salary reported in our survey is less than 25 per-

³²One respondent to our survey actually stated that part of the payment she received as pradhan is “respect.”

Figure 9

cent of the median income of rural households in Uttarakhand.³³ Given that very few pradhans have large landholdings (see same figure), it is unlikely anyone could support a household solely through the official salary.

It is thus not surprising that nearly every president in our sample continues working in the private sector (typically farming for men and domestic work for women). Every hour spent on official duties is an hour taken away from private work, which brings us to Prediction 4 that the opportunity cost of being pradhan is high. In the highest-demand season for NREGS labor—typically the dry season in the first 4 to 5 months of the year—the median pradhan reports working some 120 hours administering NREGS. Even if she spends half that time during the monsoon season, the pradhan is spending at least 22 to 23 full workdays solely on administering NREGS, and likely spends a comparable amount of time on her other official duties. It is thus not surprising that over 60 percent of pradhans believe they would have more money had they not become pradhan (see Figure 9).

7.3 Predictions 5 and 6: Corruption is Higher in Place with Higher Total Labor, but Not if the Reason is an Observable Aggregate Shock

The final two predictions, both about correlations between panchayat-level regressors and the level of corruption, raise a challenge because it is difficult to measure a correlation using a regression discontinuity design. With a larger sample it would be possible to test for whether the size of the discontinuity grows continuously with these regressors, but our sample is small to begin with and grows even smaller because not all panchayats can be linked to the 2011 census.

We instead define 3 measures of corruption, which we use as the dependent variable in sim-

³³We compute the median from the 2012 Integrated Household Development Survey.

ple OLS regressions. Let D_{it} be the days of NREGS labor allocated to household i in year t , I_p the set of households in panchayat p , $j \in I_p$ be the household of the president of p , and $\hat{j} \in I_p$ that of the runner-up. Define

$$[\text{Corruption 1}]_p = D_{j,2015} - \frac{\sum_{i \in I_p \setminus \{j\}} D_{i,2015}}{|I_p \setminus \{j\}|} \quad (6)$$

$$[\text{Corruption 2}]_p = D_{j,2015} - D_{\hat{j},2015} \quad (7)$$

$$[\text{Corruption 3}]_p = D_{j,2015} - D_{j,2013} \quad (8)$$

Corruption 1 is the difference between the president's labor allocation and the average allocation to *all other households* in the panchayat. Corruption 2 is the difference between the allocation of the president and the runner-up in the election, which is only defined for panchayats where we are able to match both winner and runner-up to their job card record. Corruption 3 is the change in the president's allocation from the year before the election (2013) to the year after (2015). When we restrict our sample to elections won by 12 or fewer votes, the means of these three measures are 38.2 for Corruption 1, 37.6 for Corruption 2, and 35.0 for Corruption 3. All are similar to the estimated discontinuity in the main specification reported in Table 2.

We test Prediction 5 by measuring the correlation between these three measures and the aggregate per household labor generated for the panchayat. Since the prediction applies specifically to differences in labor that are not driven by observable aggregate factors we control for block fixed effects. Since blocks are relatively small, weather and access to markets will be similar within a block. More importantly, the NREGS budget is fixed for each block and distributed between panchayats by a block-level program officer. A pradhan who manages to bring home more jobs relative to other pradhans appealing to the same officer might be seen as performing well.

We estimate an OLS regression of each measure of corruption on a set of block fixed effects and the average labor for all households in the panchayat *excluding the president's own household* (otherwise there would be a mechanical correlation). Though these are not regression discontinuity estimates, we nevertheless restrict to elections won by no more than 12 votes to exclude panchayats where elections are uncompetitive because, for example, one family monopolizes power.³⁴ Columns 1—3 of Table 5 show that Corruption 1 and 3 both show a significant positive correlation. Corruption 2 does not follow the pattern, but that may be because as noted earlier we cannot compute it for many panchayats, forcing us to drop roughly half the sample. These results are at least somewhat supportive of the model's prediction.

One may wonder whether block fixed-effects are adequate to controlling for aggregate factors other than the pradhan's performance. To check for whether at least persistent factors have been controlled for we run a placebo test for whether corruption in 2015 is positively correlated

³⁴We restrict to an even closer set of elections because unlike before we are comparing simple means rather than local linear estimates of the mean at the discontinuity. The results are broadly similar for other restrictions.

Table 5

	2015 Corruption vs. 2015 Performance			2015 Corruption vs. 2013 Performance (Placebo)		
	(1) Corruption 1	(2) Corruption 2	(3) Corruption 3	(4) Corruption 1	(5) Corruption 2	(6) Corruption 3
Avg. Labor (2015)	0.391** (0.172)	-0.009 (0.316)	0.911*** (0.211)			
Avg. Labor (2013)				-0.061 (0.138)	-0.172 (0.240)	-0.932*** (0.200)
Mean Outcome	38.3	37.9	35.1	38.3	37.9	35.1
Observations	478	274	478	478	274	478

Note: The panchayat is the unit of observation. “Agg. Labor” is average NREGS labor for all households in the panchayat *excluding the pradhan*. Standard errors are robust to heteroskedasticity. All regressions control for block fixed-effects.

with average labor in a different year. We compute average labor in 2013, which is reflective of the previous pradhan’s performance and should not earn higher pay for the current pradhan.

Columns 4—6 show the correlation between 2015 corruption and 2013 labor (controlling for block fixed effects). As expected, none of the 3 measures of corruption has a positive correlation with 2013 labor. Measure 3 actually has a negative correlation, which is not surprising given that it is defined as the current pradhan’s 2015 labor minus her 2013 labor. If the previous pradhan was a high-performer we would expect every household to have had a higher labor allocation, driving an almost mechanical negative correlation between Corruption 3 and average labor in 2013.

Finally we test Prediction 6, that the positive correlation detected in Table 5 does not arise if average labor is higher solely because of observable aggregate shocks unrelated to the pradhan’s performance. The most obvious such shock—and the only one we observe—is the weather. Since NREGS is meant to give people work when they would otherwise be unemployed, the government generally allocates more funds to areas where weak rainfall has damaged harvests. Block officers might be more willing to approve new work sites, making pradhan’s ability to design projects less relevant for the number of jobs available.

We first estimate a simple OLS regression of average labor in 2015 (as defined above) on the deviation in annual rainfall (in millimeters) from its recent historical average.³⁵ Since India’s monsoon cycle creates autocorrelation in the level of rainfall even after demeaning, we also control for 3 lags of demeaned rainfall.

Column 1 of Table 6 shows there is a highly significant negative correlation between average labor and rainfall. For every millimeter of below-average rainfall a panchayat receives an extra .05 days of labor per household. This estimate implies a panchayat in the 10th percentile of the rainfall distribution received 12 more days per household than one in the 90th percentile—a big difference relative to the mean of 19 days.

If the positive correlation between corruption and aggregate labor in Table 5 arises simply

³⁵We measure rainfall using the ERA-Interim Reanalysis dataset, available at <https://www.ecmwf.int/>. We match villages to the nearest interpolation point by geodesic nearest neighbor matching.

Table 6

	(1)	(2)	(3)	(4)
	Avg. Labor	Corruption 1	Corruption 2	Corruption 3
Rainfall (2015)	-0.049*** (0.018)	0.008 (0.050)	0.035 (0.066)	0.115 (0.076)
Mean Outcome	19.3	38.3	37.9	35.1
Observations	338	338	190	338
Clusters	71	71	67	71
Prior Rainfall	X	X	X	X

Note: The panchayat is the unit of observation. “Rainfall” is defined as annual rainfall (in millimeters) relative to the mean from 2005 to 2015. All regressions control for rainfall in 2012 to 2014 (“Prior Rainfall”) to account for autocorrelation in rainfall. Standard errors are clustered by block.

because pradhans steal more when there is more to steal, we would expect the estimated effects on corruption to be significant and of the same sign. But the estimates in Columns 2—4 suggest rainfall shocks have no significant effect on any of the three measures of corruption, and the estimates are in any case of the wrong sign. The non-effect of rainfall is consistent with the predictions of the screening model.

8 Discussion and Conclusion

8.1 Can Performance Pay Contracts Really Arise in an Indian Village?

Despite the evidence it may seem far-fetched that villagers in rural India would design incentive compatible pay-for-performance contracts. Though an actual written contract seems out of the question, it is not hard to see how an implicit arrangement might arise. Official salaries are low and the job is demanding.³⁶ The pradhan must take hundreds of hours away from his own farm or from paid private labor, making it hard to survive on the official salary. Lacking a better option he supplements his official income with extra NREGS jobs. Every time he gets a new project sanctioned or another work spell approved he submits his or his spouse’s name at the top of the list of requests. He might feel that villagers are less likely to complain if his own requests are mixed in with those of other households—hence the need to get more projects and more work spells sanctioned.

Meanwhile, his constituents see that he is getting far more NREGS jobs than everyone else. They might find it unfair, but they also recognize that it is a small price to pay to have someone else doing such an unpleasant job. Pradhans responding to the survey would, without prompting, complain about getting no support from the government or their constituents in administering the village. A surprising number choose not to seek re-election. Come election day some

³⁶5,000 pradhans resigned in Uttarakhand in July 2017, for example, to protest against low salaries of 750 rupees a month and a slashing of funds for gram sabhas (National Herald, July 4, 2017, available at <https://www.nationalheraldindia.com/national/5000-gram-pradhans-resign-after-ukhand-slashes-gram-sabha-funds>).

presidencies even go unfilled because no one stands for office. Given the indignities of the job, some extra NREGS labor—at the government’s expense—might seem a reasonable recompense, especially given the perception that politicians at higher levels of government are far more corrupt. And since the *pradhan* only takes jobs in proportion to the number he creates, it hardly seems worth the effort of complaining.

A pay-for-performance contract may therefore arise naturally as a solution to a specific problem and is consistent with the empirical evidence in this paper. The narrative supports Banerjee et al. (2012)’s conceptual point that the specific context is an important, but traditionally heavily understudied factor for understanding the nature of corruption and the social welfare maximizing response. The underlying reasons for corruption may be very different from one context to the next. A performance pay arrangement does not (and does not have to) arise all the time, but it may be a tool to avoid a worse situation in certain contexts.

8.2 Conclusion

It is widely accepted that lack of transparency and enforcement are one of the root causes of corruption. A natural prediction then would be zero or close to zero corruption when these two mechanisms are working. Our study shows that ensuring transparency and enforcement alone does not eliminate corruption, and the size of corruption still remains large. We find that elected panchayat presidents in rural India receive 3 times as many NREGS benefits as losers of the panchayat elections. The level of corruption is roughly equal to two-thirds of the median official salary of a president in monetary terms.

We find no evidence that this corruption is driven by imperfect observability or enforceability. There is no variation of corruption based on the geographical size of panchayats, internet access, population size, or distance to higher level government offices. The survey of council presidents that we conducted further supports the interpretation that most villagers are aware of the NREGS allocation and have the means to formally and informally hold presidents accountable. Instead, the empirical patterns are most consistent with a screening model in which open corruption functions as a form of performance pay. In the absence of another way of attracting highly qualified candidates with good outside options to stand for election, corruption here seems to function as a second-best solution.

Overall, our results suggest that the phenomenon of corruption is complex and that abolishing corruption may not be the best solution in all situations. As the existing literature has shown, a lack of transparency and accountability are often important causes of corruption. But causes of corruption can also be context-specific. In our case, corruption plausibly arises as a second-best solution to a well-defined problem that transparency and accountability alone cannot address. As developing countries and international organizations are increasingly implementing ambitious anti-poverty programs, more research is needed to understand under which conditions corruption arises across different settings and types of decision-making.

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A Theoretical Appendix (For Online Publication)

A.1 Unverifiable Ability and Probabalistic Voting

As in Section 2 suppose the voter gets utility

$$u^A = -d(G^A, G^*) + [\bar{T} - r^A]/N$$

from choosing Candidate A , where we have imposed that $T_A = T_B = \bar{T}$ as would be true in any model where there is no cost to the candidate of raising the total level of benefits. But though both candidates put in full effort to raise the level of benefits, voters believe candidates differ in their ability. Suppose each voter gets a signal of the relative ability of Candidate B with mean equal to $\delta + \sigma$ where δ is common to all voters and σ . Assuming their priors are uninformative, voters take the signal as their posterior belief. Since voters are risk neutral their preference for Candidate B is

$$u^B = -d(G^B, G^*) + [\bar{T} + \delta + \sigma - r^B]/N$$

Let $\tilde{\delta} = \delta/N$ and $\tilde{\sigma} = \sigma/N$. Then this model is directly analogous to the model presented in Chapter 4.2 of Persson and Tabellini (2000). As long as the distribution of δ has a sufficiently high variance the model predicts that $r^A = r^B = r > 0$. For example, if

$$\delta \sim U \left[-\frac{N}{2\Psi}, \frac{N}{2\Psi} \right]$$

with $\psi < (2W)^{-1}$ then

$$r = \frac{1}{2\Psi} - W > 0$$

A.2 Imperfect Accountability 1: Costly Verification and Corruption-Hiding

Now suppose the promises of the elected candidate cannot be costlessly verified. The candidate promises \tilde{r} , but voters must pay a cost $v > 0$ to discover and collect verifiable evidence of the actual level of rents r . It is crucial that the actual level must be verified to punish a broken

promise. In equilibrium voters can reason what the actual level of rents must be, but can't act on this knowledge without paying the cost to prove it.

Voters still prefer a candidate who promises lower rents even if they expect he will break the promise because in the event that they detect and prove his corruption he can only be forced to deliver \tilde{r} . Then the first stage of the game, the election, is much the same and both candidates promise platforms $(G, T, \tilde{r}) = (G_M^*, \bar{T}, 0)$. In the second stage of the game each voter decides whether to verify the winning candidate's promises, and the winner (who is now the president) decides his level of corruption and how much effort he will put into hiding it. Since the president promised $\tilde{r} = 0$, a typical voter's utility is

$$u = \begin{cases} -d(G, G^*) + [T - r]/N & \text{if no one verifies} \\ -d(G, G^*) + T/N & \text{if someone else verifies} \\ -d(G, G^*) + T/N - v & \text{if personally verified} \end{cases}$$

There is a collective action problem in the voter's utility function. In any equilibrium where $r > 0$ the voter is better off if someone verifies the promise. But by taking initiative and doing the verification the voter earns a benefit of only r/N at a cost v . If r is small or N is large compared to v the voter will not verify the promise even if she knows that in equilibrium it is being broken.

Suppose further that the president can make verification more costly by hiding his corruption. Let the verification cost be a function of an exogenous information friction ζ and the president's hiding effort h :

$$v = \bar{v}(h, \zeta) \quad \text{where } \bar{v}(0, \zeta) = 0, \bar{v}_h > 0, \bar{v}_{hh} < 0, \lim_{h \rightarrow 0} \bar{v}(h, \zeta) = \infty, \bar{v}_{h\zeta} > 0$$

Hiding effort might take the form of creating "ghost" projects that contain only the president and no other worker. The information friction might be larger in panchayats comprising multiple revenue villages (where the president is physically isolated from some part of the electorate).

But corruption hiding is costly. Suppose the candidate's utility is now

$$U = \begin{cases} W + r^X - \kappa h & \text{if winner} \\ 0 & \text{otherwise} \end{cases}$$

where the implicit assumption is that the candidate would not be paying to hide corruption if he loses the election. The president will choose h and r to make the cost to the voter just equal to the benefit:

$$\begin{aligned} \bar{v}(h, \zeta) &= r/N \\ \Rightarrow h &= \bar{v}^{-1}(r/N, \zeta) \end{aligned} \tag{9}$$

Back-substitute (9) into the utility function of the winning candidate to get the candidate's stage-

two decision for r :

$$\begin{aligned} \max W + r - \kappa \bar{v}^{-1}(r/N, \zeta) \\ \Rightarrow \bar{v}_h(r/N, \zeta) - \kappa/N = 0 \end{aligned} \quad (10)$$

Since \bar{v}_h grows arbitrarily large as r approaches zero, this expression implies that $r > 0$, implying there are rents in equilibrium in the model of corruption hiding. Applying the implicit function theorem gives the comparative statics

$$\begin{aligned} \frac{dr}{dN} &= r + \left(\frac{\kappa}{-\bar{v}_{hh}(r/N, \zeta)} \right) > 0 \\ \frac{dr}{d\zeta} &= \frac{1}{N} \frac{\bar{v}_{h\zeta}(r/N, \zeta)}{-\bar{v}_{hh}(r/N, \zeta)} > 0 \end{aligned}$$

These comparative statics imply several tests of the model of corruption hiding:

Test 2 (Corruption-Hiding Model) *The Corruption-Hiding Model predicts that in equilibrium there will be positive rents, and*

1. *election winners make costly efforts to hide their rents*
2. *rents are lower in places with fewer information frictions*
3. *rents are lower in places with smaller populations*

A.3 Imperfect Accountability 2: Selective Enforceability and Factionalism

Suppose instead that voters have no trouble verifying promises about how benefits will be distributed, but only promises to certain people can be enforced. There are two organized factions F_A and F_B , which are equally sized subsets of the electorate.³⁷ These factions might be (extended) families or castes. All members not in either faction are lumped into the group of “other” voters F_O . Members of an organized faction can enforce promises made by their own members.

Each organized faction chooses a candidate through a primary election where each candidate promises the platform she will take to the general election. (The “other” voters can field a candidate, but as we show this candidate will never win the general election and can safely be ignored.) As before the candidate promises a policy G^X , a level of total benefits T^X , and personal rents r^X , but now she must also announce how many benefits she will to each group: T_A^X, T_B^X with T_O^X implicitly defined by the budget constraint $T_O^X = T^X - T_A^X - T_B^X - r^X$. Assume preferences over G are independent of faction. Relaxing this assumption would not change our predictions about the allocation of program benefits, only about which policy is implemented.

³⁷The assumption that factions are equally sized ensures there is a pure strategy equilibrium, but is not important for the predictions we will test.

Since we do not observe G there is no benefit in complicating the model with group-specific preferences.

Though platforms are determined in the primaries, candidates and primary voters are looking forward to the general election to decide which promises would help the faction win. Suppose Candidate A , the winner of the A primary, promises $T_B^A, T_O^A > 0$. Since she cannot be held to this promise, voters in F_B and F_O will treat any promise of positive benefits the same as a promise of zero benefits. Then $T_B^A = T_O^A = 0$, and by a similar argument $T_A^B = T_O^B = 0$. Since candidates drawn from F^O cannot make any enforceable promises, their platform must be $T_A^O = T_B^O = T_O^O = 0$. As we show below, this inability to commit implies that non-factional candidates can never win, implying they never stand for election. Finally, since preferences over policy are independent of faction it must be that $G^A = G^B = G_M^*$.

The promises of the factional candidates to their own factions, and their promises about corruption, are determined in the primary. We solve for the outcome of the F_A and appeal to symmetry for the outcome of the F_B primary. Since it is costless for candidates to offer higher total benefits, $T^A = \bar{T}$. By the budget constraint, $T_A^A = \bar{T} - r^A$. By the free entry assumption any candidate promising $r^A > 0$ can be undercut by a challenger offering $r^A - \varepsilon$, driving r^A to zero. Then $T_A^A = T_B^B = \bar{T}$ and $r^A = r^B = 0$.

In summary the factional primaries elect candidates who promise not to give themselves any extra program benefits. But they also promise to deny benefits to anyone outside their own faction. In the general election all factional voters vote for their own faction and all unaffiliated voters split their votes evenly across all candidates. If a F_O candidate stands for office she wins one-third of the F_O vote and none of the factional votes, implying she will never win. Then unaffiliated candidates are deterred from standing for office. The factional candidates win the votes of their own factions and split the non-factional vote. Since the factions are assumed to be of equal size each candidate is equally likely to win. Then the testable predictions of this model are that although there is no personal corruption, the winner of the election gets more benefits than the loser because the winner is a member of the winning faction. The model predicts we would find a similar gap had we chosen any other member of the winning and losing factions.

Test 3 (Factionalism Model) *The Factionalism Model predicts that in equilibrium the winning candidate will get more benefits than the losing candidate. However, it also predicts*

1. *the average member of the winner's faction will earn more rents than the average winner of the loser's faction*
2. *there is little or no difference between the benefits earned by the candidate of the winning faction and the average member*

This second prediction hinges on our assumption of free entry into the primary. Since that assumption need not hold, we put more weight on the first prediction. As we show, neither prediction holds.

Finally, we make one simple addition to allow for external enforcement (punishment by higher levels of government). Suppose that in a fraction ρ of villages any citizen can seek external enforcement of the winner's promises. In these cases a citizen might lodge a complaint with a program officer or a district commissioner. In the other $1 - \rho$ cases the model outlined above applies. Suppose ω is some factor (e.g. physical distance) that makes it harder to seek redress from these higher government officers (meaning $\frac{d\rho}{d\omega} < 0$). It is easy to see that rents would then be higher in villages where ω is high.

Test 4 (External Enforcement) *Corruption is higher in villages that are more distant from higher levels of government.*

B Empirical Appendix (For Online Publication)

B.1 Additional Background Information on NREGS in Uttarakhand

In Uttarakhand, NREGS is an attractive scheme for local governments because it allows for the creation of jobs even in rural and remote villages in the mountains where employment opportunities outside the agricultural sector are otherwise difficult to come by.³⁸ This could reduce the need for outward migration in search for employment. At the same time, the public-works projects could help improve local development, for example by improving infrastructure.³⁹ From the perspective of council presidents, this allows them to decide on the allocation of substantial resources without having to pay for them.

While there is hardly any quantitative research on Uttarakhand's implementation of NREGS, newspaper coverage is typically very negative: Newspaper reports note the absence of a well-functioning planning process at gram panchayats, leading to low job availability and a low quality of carried out projects not properly supervised by unmotivated personnel.⁴⁰ Administrative statistics about NREGS also usually show Uttarakhand as one of the worst-performing states, which has been noted as surprising giving its relatively high GDP per capita and literacy levels. Implementation challenges are attributed to the difficult topographical conditions in a predominantly hilly state.⁴¹ Only 3 to 5 percent of households in Uttarakhand get the full 100 days of employment. At the same time, Uttarakhand was one of only six states in 2014 where more than

³⁸Investment opportunities and employment is disproportionally created in the plains rather than in the mountainous regions of the state (Hindustan Times, 'Hills of Uttarakhand filled with 'ghost villages' as growth inequality widens', March 10, 2017).

³⁹Public-works projects under NREGS have to fall under one of nine permissible categories, which include water and soil conservation, afforestation and land development (Government of India, 2009). This list was later expanded to include investment in irrigation, land development and horticulture plantations on private land of below-the-poverty-line or low-caste households as well as the construction of toilets on private property or in community spaces (Live Mint, 'MGNREGA, a cash transfer scheme?', March 18, 2013).

⁴⁰Live Mint, 'MGNREGA, a cash transfer scheme?', March 18, 2013; Mainstream Weekly, 'Working of NREGA Voices from Panchayats', April 2, 2009.

⁴¹Financial Express, 'The state of MGNREGA performance: If inefficient states perform at par, huge gains are possible', March 14, 2017. See also India Spend, 'The Whys and Whats of India's Rural Jobs Scheme', November 4, 2014.

50 percent of wage payments were made within 15 days, the mandated time frame of the program.⁴² Newspaper articles have also reported on various NREGS corruption scandals involving members of the gram panchayat.⁴³

Qualitative research carried out from 2006 to 2008 also suggests that NREGS faces a number of the same challenges in Uttarakhand as in other states (Mathur, 2016). Before the program's introduction, development programs in Uttarakhand operated according to a system colloquially referred to as 'Contractor Raj': The contractor with the best ties to local politicians implemented development projects, using a portion of the allocated funds for the program. To make a profit, the contractor typically underpaid workers and used lower-quality materials. The rest of the funds were allocated among local government functionaries according to the 'PC system', where the 'percentage cut' depended on the person's position. The 'PC system' is generally believed to make up about 25 to 30 percent of total funds. The paperwork for the development schemes was then adjusted to hide all side payments. In a number of areas in Uttarakhand, the village council president was also the contractor (Mathur, 2016).

The paperwork and account structure of NREGS, as well as the later changes to bank accounts and identification numbers, were all implemented with the specific goal of making these corruption systems much more difficult to carry out. NREGS prohibits the use of contractors, and a paper trail of all NREGS processes needs to be kept. Documents are spread over a number of stakeholders, most importantly the program's beneficiaries: Information on employment spells with exact dates and project names is put on a household's job card, which is supposed to remain in the constant possession of workers. Households are also supposed to receive a written time-stamped confirmation of their submission of a job request, and all this information is also uploaded to a publicly available NREGS website, which allows verification by beneficiaries, NGOs and other stakeholders in close to real time.⁴⁴ The system contains a couple of automatic safeguards and alerts: Unless the maximum of 100 days is relaxed by the state government, a household cannot be allocated more than 100 days of work in the system. The proper sequence of steps of the employment process needs to be kept to be able to enter the corresponding information.⁴⁵ In areas with reliable internet access, the information is supposed to be directly

⁴²Indian Express, 'More than 70% NREGA wages unpaid this fiscal year', January 29, 2015. More recently, there have been large-scale wage payment delays in a large number of states, including Uttarakhand (Times of India, 'Large-scale pending NREGA payments in April-May 2017', May 27, 2017).

⁴³See e.g. Times of India, 'Rs 12 lakh NREGS scam comes to light in Haridwar, inquiry set up', September 8, 2017; Times of India, 'MGNREGA scam: Beauty parlour owner, students' figure as beneficiaries', August 10, 2017; Times of India, 'Farmer exposes scam in rural scheme; threatened', May 5, 2015; Amar Ujala, 'JE, VDO and former head arrested in MNREGA scam', June 21, 2016; Amar Ujala, 'Pradhan sought payment of NREGA', May 31, 2016; Amar Ujala, 'Rigged in MGNREGA', September 14, 2016; Amar Ujala, 'Recruitment Forgery MNREGA', September 29, 2016

⁴⁴All NREGS related information has to be entered into a software application called NREGASoft. The system contains multiple modules to track different aspects of the scheme, such as employment demanded by workers and jobs allocated, proposed and approved works projects as well as fund and labor budget management modules (Government of India, 2013).

⁴⁵Work cannot be allocated without a demand for employment registered in the system, for example. Muster rolls can only be generated after work has been allocated, and no expenditures can be recorded for a project that is marked as completed. The system also checks that the paid wage is not higher than the notified MGNREGA wage rate, and

entered into the online system by the administrative level at which the step occurs. In other areas, printed muster rolls can be used to check NREGS attendance, and the information is then entered into the offline version of the software program, which can then be synced with the online database at a later point. All of these administrative safeguards did not exist for previous development programs, making the effort needed for corruption much higher under NREGS.

Mathur (2016) notes that the transparency measures initially led to a large decrease in the ability to implement NREGS in Uttarakhand despite the large increase in financial resources available for the poor mountainous areas⁴⁶: Contractors as well as local politicians were much less interested in a program where corruption was more difficult to hide than in other development schemes. But pressure to increase implementation came from higher administrative levels, not least because NREGS allocations of funds were paid out in installments, with the next installment conditional on at least 60 percent of the previous installment being used. NREGS was therefore implemented with some of the same issues as in other states, including ghost workers and the underpayment of workers. Account books were submitted despite documenting wages below the minimum wage (Mathur, 2016).

As elsewhere, the direct payment into bank accounts and the link to aadhar numbers has made corruption much more difficult, further increasing the effort required to carry out corruption off-the-books. At the same time, diverting funds to the pradhan and other gram panchayat members, or allocating jobs preferentially to individuals with close connections to the gram panchayat, could still be carried out openly in the accounts. Newspapers have noted that there was an uptick in NREGS employment during Uttarakhand's state election year, for example, suggesting that NREGS is being used as part of a re-election strategy (Indian Express, 'Poll-bound UP, Uttarakhand, Punjab see NREGA work rise', January 12, 2017).

that a worker is not employed on more than one project in the same time period. Projects have to be marked as approved in the system before they can be implemented, and measurement books that are the foundation for wage payments can only be filled out for activities that have been approved and where a technical estimate exists in the system. The system automatically creates alerts for project and wage payment delays, projects with exploding costs of more than 10 percent of the original cost (Government of India, 2013).

⁴⁶NREGS was even labelled 'unimplementable' in Uttarakhand (Mathur, 2016).