Female employment and voter turnout - Evidence from India

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Abstract

Previous research on the effects of employment on voter turnout yields mixed results. Combining data from the largest workfare program in the world with data from over 50,000 Indian polling stations we show that increased employment substantially increases female turnout. Mechanism tests suggest the results are driven by employment rather than income and program satisfaction. In particular, we find increases in the number of friends, discussions of politics with more people, and increased knowledge of politics. We also find effects on non-electoral political participation and we argue that the effects we identify are driven by autonomous political participation.

1 Introduction

Inequality in voting turnout across genders implies inequality in political representation. This represents a democratic problem as men and women have different political preferences (see e.g. Chattopadhyay and Duflo, 2004), and as inequalities in political participation may reproduce other types of inequalities and create a mismatch between policies and actual social preferences (Lijphart, 1997). Women's lower political participation may also prevent them from gaining political knowledge, skills and political networks, making inequality in participation self-sustaining as politicians may target the more politically salient men (Bleck and Michelitch, 2018; Prillaman, 2021).

Female employment is thought to increase turnout and political participation more broadly via several channels (Isaksson, Kotsadam and Nerman, 2014; Robinson and Gottlieb, 2019). It directly increases incomes, which might not be a binding constraint for most types of participation but it may be important through increased bargaining power in the household. Also, employment often leads to improved civic skills, political knowledge, and access to networks. On the other hand, employment is time consuming, and hence, the effect on participation could go in the opposite direction (Schlozman, Burns and Verba, 1999). Aalen et al. (2021) also show that poor employment conditions can actually decrease political efficacy.

In this paper, we study the effect of women's employment on women's turnout in India. We identify the relationship by exploiting variation in the availability of jobs in the *National Rural Employment Guarantee Scheme* (NREGS). NREGS is the largest workfare program in the world, employing 40 to 50 million rural households every year. We focus on the largest state in India, Uttar Pradesh, with a population of more than 200 million people.

Our main finding is that the program increases turnout, and we argue that the effect is caused by increased employment rather than other program induced changes or omitted variables. In particular, we find no effects on men, whom are much more likely to work regardless of NREGS; no effects on party choice, which would be expected if the program increased turnout via pork barrel spending; and no effects on the local concentration of party vote shares, which would be expected if the effect was driven by block voting and mobilization of women voters.

We do not believe that the effects of employment are driven merely by income increases, for the following reasons: i) the total number of days worked in NREGS are capped, and in our sample, individuals in the program only work around 30 days per year on average; ii) we find larger effects in areas where the program has the largest effects on whether or not women are

working, rather than in areas where it is more likely to only increase income; iii) NREGS work is conducted in groups where women work together with other women, often from different castes, communities and neighborhoods, which directly increases their networks (Jenkins and Manor, 2017; Khera and Nayak, 2009).

We provide further support for this interpretation using data collected by Prillaman (2021) in the neighboring state of Madhya Pradesh. Using this data, we show that NREGS employment leads to a larger number of friends in the village, a larger number of people whom women discuss politics with, and to greater political knowledge. Interestingly, we find no effects on bargaining power within the household. We also show that NREGS seems to increase meeting attendance and non-electoral political participation more broadly. In combination with the evidence against block voting, these findings are therefore most consistent with increases in autonomous political participation, rather than elite induced or mobilized participation. This is important normatively, particularly in developing country settings, and particularly among women where gendered social pressures and norms are strong, as autonomous political participation has the potential for furthering women's agency and making preferences of the electorate more aligned with those of the population (Bleck and Michelitch, 2018; Collier, 1982; Giné and Mansuri, 2018).

The conclusion from our quantitative mechanism tests is consistent with qualitative evidence. Olausson (2017) interviewed women in Andhra Pradesh, which is another neighboring state, and found for instance one women stating: *"Before NREGA I never voted and I am very proud and empowered to be able to do this now"* (p.33); and another women explaining: *"I have become more politically aware now as we discuss politics when we work in NREGA. Twenty people discuss politics and village issues. I believe this has influenced my political involvement. NREGA creates a platform where we can discuss village politics while working"* (p.34). In many ways, the NREGS worksites have similarities with the so-called Self-Help Groups (SHGs) in India, which Prillaman (2021) shows lead to higher political participation. Like the SHGs, the NREGS worksites bring together women with shared interest, which may foster discussions on politics and on other issues, and generate capacity for collective action, for instance through collective protests when wages are withheld. In patriarchal settings where women otherwise have few social ties (Kandpal and Baylis, 2019), such networks may be difficult to find.

Our paper contributes to the small but growing literature on the causal effects of employment on turnout (see Margalit, 2019, for an overview). Previous literature has mostly used trends in general employment to identify effects and the results are overwhelmingly from devel-

oped countries. We specifically contribute by estimating the effects of an actual policy, which increases the policy relevance of our findings. Our tests of mechanisms are also more extensive than in previous literature, which has not separated out income, knowledge, and network effects of employment. In the only study with a design to identify causal effects outside of Europe or the US, Aalen et al. (2021) find that factory employment in autocratic Ethiopia has no effect on turnout intentions but that it lowers participation in community meetings. Aalen et al. (2021) argue that their negative finding is due to the extremely poor working conditions in their setting. Our paper contributes to the understanding of scope conditions, in particular considering that we find positive effects of employment in a relatively poor country with low gender equality in general. One possible interpretation is therefore that the work environment has to be minimally hospitable for any positive effect on turnout to materialize. Finally, we are able to study turnout over a relatively long time period, which is important as the effects of employment have previously been found to be temporary.

2 The National Rural Employment Guarantee Scheme

NREGS was rolled out in rural India during the years 2006 to 2008 and is now the world's largest workfare program, employing 40 to 50 million rural households each year. Below we emphasize two characteristics of the program that are particularly relevant for our later explorations.

The first characteristic is the high level of female participation. In many Indian states, more than half of the NREGS jobs are taken up by women (Ravi and Engler, 2015). This contrasts sharply with the regular labour market where male workers are in overwhelming majority (Klasen and Pieters, 2015). The program has explicit quotas for women and there are several other program features that are attractive to female workers. Equal wages for men and women is one such feature. Since women typically are paid less than men in other types of jobs, equal wages imply that NREGS is relatively better paid for women. Short work distance is another. The worksites are most often located within workers' own village, and this is likely to be important for women combining household work with paid work. Relatedly, work hours in the program are clearly regulated and the worksites have child care facilities.

Khera and Nayak (2009) describe how these factors, and the fact that women work together in groups, help make the public jobs "socially acceptable". As such, NREGS is likely to provide the first real work opportunity for many women in rural India. The pattern in Figure 1 is consistent with this assertion. Based on the *NSS Employment-Unemployment survey* from 2011-12, we show that more than 80 percent of the female NREGS workers in Uttar Pradesh

did not have any other type of paid work. This suggests that they would not have been working in the absent of NREGS, and also, that the program plausibly induces significant behavioral changes.

The second important characteristic is the large *variation* in NREGS. In the empirical analysis we explore changes in the availability of jobs over time. In principle, the variation should be driven completely by demand for work, as every rural household is legally entitled to request 100 days of work each year. Still, mounting evidence suggest that most of the variation in NREGS is due to unmet demand for employment (Dutta et al., 2014). In practice, the program is therefore best described as supply constrained.

Several factors are likely to be decisive for the program implementation at the local level. The fiscal and administrative capacity of state and lower level governments is one important factor.[1] The fact that the poorest states in India, where demand expectedly should be highest, consistently have supplied fewer NREGS jobs than the richest states is consistent with this (Imbert and Papp, 2015). Previous research suggest that the motivation and incentives of politicians and bureaucrats also matter. This strand of research has focused on the allocation of funds across either states, districts or development blocks, highlighting the role of state-level politicians and block-level bureaucrats (see e.g. Gulzar and Pasquale, 2017; Gupta and Mukhopadhyay, 2016). In our empirical analysis we utilize variation at the lower level of Gram Panchayats. Thus, our estimation abstracts from the possible strategic allocation of funds across these higher administrative levels.

3 Empirical approach

We use three main data sources to study the relationship between employment and voter turnout. Firstly, we use the 2001 Census village map from the InfoMap. This map provides boundaries of every Census village, which facilitates the merging of other datasets with geographical identifiers. In addition, we make use of the 2011 Census to obtain Gram Panchayat characteristics. Secondly, the Susewind (2016) dataset provides information on key characteristics of the polling booths in Uttar Pradesh, including GPS coordinates. As every eligible voter in India has to vote at one specific polling booth, we can credibly calculate turnout rates at this level. Thirdly, we extract Gram Panchayat level data on NREGS from the MGNREGA Public Data Portal, which we link to the Census based on fuzzy matching on location names.

[1] The central government provides most of the funding, but local governments still have to pay a share of the project costs and some of the administrative costs.

Overall, this gives us an estimation sample of 50,490 polling booths from 21,116 Gram Panchayats (about 36 percent of all Gram Panchayats in Uttar Pradesh). We provide more details on the data construction in Appendix A.

We capture the effect of employment on turnout by using *time* variation in the number of NREGS jobs within Gram Panchayats. We regress changes in female turnout between the elections in 2014 and 2017 on changes in female workdays between the financial years 2013-14 and 2016-17, adding block fixed effects constructed within each State Assembly constituency (as some blocks are split between different State Assembly constituencies).[2] The specification can thus be written as follows:

$$\Delta Female\ turnout_{ijkl} = \beta \Delta \text{IHS}(Female\ workdays_{jkl}) + X1'_{ijkl} + X2'_{jkl} + \theta_{kl} + e_{ijkl}, \quad (1)$$

where the subscript i denotes polling booths, j denotes Gram Panchayats, k denotes development blocks and l denotes State Assembly constituencies. Our main NREGS measure captures changes in the inverse hyperbolic sine (IHS) of female workdays. The β-coefficient in (1) can be interpreted in the same way as with a log-transformation, but unlike the log, the IHS is defined for the value of zero (Burbidge, Magee and Robb, 1988). We also include a set of polling booth level controls measured in 2014 ($X1'_{ijkl}$): male and female turnout rates, total number of eligible voters, number of eligible Hindu and Muslim voters; and a set of Gram Panchayat-level controls from the 2011 Census ($X2'_{jkl}$): total population; the number of Schedule castes, Schedule tribes, literate men and literate women; availability of public schools, government health clinics, electricity, tap water, paved roads and public transport. The fixed effects for blocks×State Assembly constituencies are denoted by θ_{kl}.

A causal interpretation of the β-coefficient requires that the local variation in NREGS employment is orthogonal to factors determining voter turnout. We believe this is plausible given that our identifying variation is within small geographical areas and given that employment in the program is determined primarily by constrained supply. This is particularly so for women, we believe, because female participation is likely to depend on work being provided close to residence. We provide an extensive validation of the identifying assumption in Appendix B.

[2]The election in 2014 was for the national parliamentary, while the election in 2017 was for the State Assembly, which is analogous to the national parliament but at the state level.

4 The effect of employment on turnout

In this section we present our main results. We first estimate (1) without any of the controls, except the fixed effects. The impact of female workdays on female turnout is positive and highly significant (Column 1 of Table 1). We then add the polling booth and Gram Panchayat controls (Columns 2 and 3). This has barely any impact on the point estimate, but it increases R-squared and the precision of the estimates.[3] The magnitude of the effect is considerable. By scaling the coefficient, we show that the effect implies that about 7 percent of the female NREGS workers *that previously did not vote*, would start to vote due to the workfare program (see Appendix C). Thus, the estimated effect is both statistically and economically significant. In Appendix D, we show that this finding is robust to alternative specifications and coding choices.

How should we interpret the effect? Previous studies have found that policies that increase peoples' incomes, such as cash transfers (Pop-Eleches and Pop-Eleches, 2012) and foreign aid (Knutsen and Kotsadam, 2020), increase turnout and in particular voting for the incumbent. In our case, however, we find no effects on voting *patterns* (see Appendix E). It thus seems implausible that the effect on turnout stems from program satisfaction and from rewarding politicians for providing goods. Similarly, we find no effects on the local *concentration* of party vote shares (again see Appendix E), which we would expect if the effect was caused by targeting of female workers by political parties, for instance at the NREGS worksites. This result is therefore inconsistent with block voting being the key mechanism. Nor do we think the effect is caused by higher incomes, as the income gains, after all, are modest. In our sample, the average number of workdays per NREGS worker, *per year*, is only 30. Using the Indian Human Development Survey from 2011-2012, we calculate that the median female NREGS worker in Uttar Pradesh earns an amount equal to just 5 percent of total household income.

Instead we believe that one key mechanism is a network effect, linked to how NREGS induces women to work, and thereby, to spend time outside their household. This move into the public sphere might in itself improve self-confidence, raise aspirations and change views on what women can and cannot do – including their views on political involvement. The *way* the worksites are organized may also facilitate political awareness and provide an (unusual) arena to meet new people.

[3]It is especially the lagged turnout variables (for men and women) that increase precision, as can be seen by comparing Columns 2 and 3. The fact that the coefficient barely changes once we control for female turnout in 2014, which essentially is a lagged dependent variable, also suggests that the so-called Nickell bias (Nickell, 1981) is of little empirical relevance in our setting.

We conduct several (indirect) tests of mechanisms in our setting. Our proposed mechanism implies that the impact of NREGS should be smaller on women that already have work in the regular labor market. We test this implication using data from the Economic Census of 2013, which provides a full enumeration of all non-farm establishments. We calculate the female worker share at the block level and interact this with female NREGS workdays. To ease interpretation, we standardize the worker share to mean zero and standard deviation one. We find that the effect of NREGS is highly dependent on the level of female employment outside the work program (Column 4 in Table 1). As an alternative specification, we also interact changes in female workdays with binary variables for quartiles of the worker share variable (Column 5). The effect in the 25 percent of areas where most women are working is significantly smaller.[4] Similarly, the mechanism should imply a smaller effect on men's turnout, for the following two reasons. First, NREGS provides a weak signal for whether or not men are working, since they are likely to have additional paid work (see Figure 1). Second, men are much less constrained than women and they are likely to have a larger network regardless of their labor force participation. We test this by estimating (1) using male turnout as the outcome (Columns 6 and 7), and find much smaller effects than for female turnout.

We provide further support for the network interpretation using data collected by Prillaman (2021). This dataset is from 2016 and covers 152 villages in the neighboring state of Madhya Pradesh, which we merge with our administrative data on NREGS employment (see Appendix F for more details on the data and for additional analyses). First, using an empirical setup similar to our main specification above and women's self-reported voting turnout in the state election in 2013 and the local (Panchayat) election in 2014-2015, we find sizeable effects of NREGS employment on voting (Column 1 in Table 2). Given that the level of NREGS employment is much higher in Madhya Pradesh the point estimate is broadly consistent with our main estimates.

More importantly, the Prillaman (2021) dataset allows us to investigate the effects of female employment on non-voting political participation, knowledge, and on social networks. We are however only able to do this in the cross-section, which implies that the analysis should be seen as somewhat suggestive. We first show that the number of female workdays per capita in 2015-2016 predicts whether females in the 2016-survey report any paid work during the last year (Column 2 in Table 2). We next document that NREGS seems to increase the number of friends women have in the village (Column 3); the number of people they discuss politics with (Column 4); their political knowledge, as measured by an "Information index" (Column

[4]Adding terms we note that the effect is not statistically significantly negative in the fourth quartile.

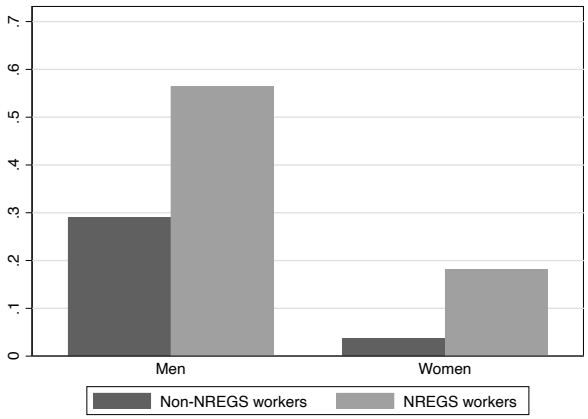
5); and their non-electoral political participation, as measured by a "Nonvoting participation index" (Column 6). These results show that networks, as well as knowledge, are important mechanisms and they provide additional evidence suggesting that the effects of employment on turnout are driven by autonomous political participation.

5 Conclusion

Combining data from the largest workfare program in the world with data from over 50,000 Indian polling stations, we find that policy-induced changes in employment substantially increase female turnout. A series of tests make us confident that the effects we identify stem from employment rather than from rewarding politicians for providing goods. In particular, we find no effects on party choice, political fragmentation, or incumbency support.

Our results show that policy and employment are able to increase female turnout, which is especially important given that men and women have been shown to have different political preferences in India (e.g. Chattopadhyay and Duflo, 2004). This is also important as the effects of employment are generally unclear and as there is a need for concrete policy advice on how to increase turnout. We hope that future studies will continue to investigate the relationship between employment and turnout in other settings so that we can reach a better understanding of the scope conditions for the effects of employment on political participation. A particularly useful endeavor would be to explicitly test for the moderating role of working conditions. We also urge future studies to investigate the effects of employment for different types of individuals, in particular for individuals of different gender and caste.

FIGURE 1: Employment shares outside NREGS



Note: The figure is based on data from the *NSS Employment-Unemployment survey* from 2011-12, and is restricted to respondents from Uttar Pradesh.

TABLE 1: NREGS employment and voter turnout

Dep. var.:	Δ Female turnout					Δ Male turnout	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔIHS(*Female workdays*)	0.087***	0.081***	0.085***	0.078***	0.126***	0.024	
	(0.030)	(0.030)	(0.025)	(0.025)	(0.043)	(0.025)	
ΔIHS(*Male workdays*)							0.035
							(0.027)
ΔIHS(*Female workdays*)				-0.071***			
× female worker share (std)				(0.023)			
ΔIHS(*Female workdays*)					0.048		
× female worker share, quartile=2					(0.066)		
ΔIHS(*Female workdays*)					-0.042		
× female worker share, quartile=3					(0.067)		
ΔIHS(*Female workdays*)					-0.191***		
× female worker share, quartile=4					(0.068)		
Observations	50490	50490	50490	50007	50007	50490	50490
R^2	0.167	0.174	0.493	0.494	0.495	0.484	0.484
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Lagged turnout	No	No	Yes	Yes	Yes	Yes	Yes
Dep. var mean	4.944	4.944	4.944	4.944	4.944	-1.668	-1.668

All regressions include Assembly constituency times block fixed effects. Robust standard errors clustered at the level of the fixed effects are shown in the parentheses. The voting variables capture changes in turnout between the 2017 and 2014 elections, while the NREGS variables capture changes in workdays between 2013-14 and 2016-17.
*** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent.

TABLE 2: Regressions based on Prillaman (2021) dataset

Dep. var.:	ΔFemale Turnout	Worked last year (0-1)	#Friends in village	#Discuss politics with	Political knowledge (0-9)	Nonvoting participation (0-8)
	(1)	(2)	(3)	(4)	(5)	(6)
ΔIHS(*Female workdays*)	1.069**					
	(0.494)					
IHS(*Female workdays, per capita*)		0.044*	0.418***	0.104*	0.172*	0.134*
		(0.026)	(0.128)	(0.059)	(0.091)	(0.076)
Observations	152	2645	2645	2645	2645	2645
R^2	0.881	0.096	0.051	0.132	0.166	0.100
Dep.var mean	17.016	0.490	2.593	1.028	4.594	0.864

All regressions include Assembly constituency times block fixed effects. Robust standard errors clustered on Gram Panchayats are shown in the parentheses. The ΔIHS-variable captures Gram Panchayat level changes in workdays between 2012-13 and 2013-14, while the IHS-variable captures workdays in 2015-16 divided by the female population. The regression in the first column is collapsed to the village level. All regressions include the full set of village controls, and a set of individual controls (averaged to the village level in the first column).
*** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent.

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