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India's Rural Employment Guarantee Scheme: Has it Reduced Poverty in Chitradurga District of Karnataka?

A field-study of the implementation of India's often-cited 'Mahatma Gandhi National Rural Employment Guarantee Scheme' in a district in the southern state of Karnataka has shown that there has been some impact on poverty reduction in the countryside. Another finding is that the scheme has benefited poor women more than men.

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Abstract

In this paper, we evaluate India's flagship rural employment guarantee programme, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), by answering questions such as whether the MGNREGS wages have been above their reservation wages. Furthermore, we estimate the reservation wages as a function of

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individual and labour market characteristics, being the first study to do this in the Indian context and compute net benefits from MGNREGS jobs. Next, we understand what demand-side (individual) and supply-side (programme) characteristics determine enrolment in the programme and determine MGNREGS wages.

Using data from extensive primary surveys of MGNREGS beneficiaries and non-beneficiaries in Chitradurga in Karnataka, we find that women tended to benefit more from the programme. This is a major MGNREGS contribution because women have always been paid less than men on farms and construction sites. The wages NREGS beneficiaries got were well below than their asking wage (which was Rs.207 a day), being only Rs.98 on average. The estimation of reservation wages shows that higher current wages increase reservation wages. The elasticity of reservation wage with respect to work experience is negative.

We estimated a two-step regression model to understand the determinants of participation in the programme and of NREGS wages. We conclude that the programme has had a favourable impact on reducing rural poverty.

JEL Classification: R23, R28

Key Words: MGNREGS—India, Employment guarantee programme, Rural poverty—India; Rural-urban linkages

India's Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS): Has it impacted poverty in Chitradurga district of Karnataka?

Introduction

The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) is a flagship programme of the Government of India, launched in 2006 as mandated under National Rural Employment Guarantee Act 2005 (NREGA).[3] Under MGNREGS, rural households willing to do unskilled manual labour are constitutionally entitled to demand employment up to hundred days in a year from their respective Gram Panchayats (GPs).[4] The main objectives of MGNREGS are rural poverty alleviation, prevention of rural – urban migration (based on the assumption that such migration is necessarily bad), creation of durable and productive assets and environmental conservation. Another key aspect of NREGA is guarantee of 33% reservation of work opportunities for women and equal wages.

There is a perception in India's urban areas (specifically the real estate and the construction sectors) that NREGS has driven the labour back to rural areas and has created shortage of required labour in the urban areas. The academic debate on the programme has focused on whether the programme has had any beneficial impacts, if at all. Hence in this paper, our objectives are to examine the following:

1. What do the NREGS beneficiaries do apart from their NREGS work? What is the proportion NREGS work forms in their schedule?

[3] In this paper, the terms NREGA, NREGS, MGNREGA, MGNREGS all refer to the same programme and are used interchangeably.

[4] It may be instructive to note that for administrative purposes, a district in India is divided into the following divisions:
1. Taluks
2. Blocks
3. Gram Panchayats
4. Villages

A gram panchayat is the smallest unit of rural, local self-government at the village or small town level, usually headed by a democratically elected *Sarpanch.*

2. Did the NREGS work so created have any hysteresis effects (hysteresis in the labour market is used to refer to the short and long-run impacts of a one-time shock (such as an employment guarantee programme) on their skills, employability, training and so forth) on their long run employability? What do the NREGS beneficiaries do after the completion of NREGS work? Where do they go and what kind of work do they engage in?
3. Have the NREGS wages been above their reservation wages? Reservation wage is the lowest wage at which a person is willing to accept a new job. It is similar to the reserve price for a good, an entry barrier for a person to take up a job. In this, we address the related question: What were the net benefits from NREGS jobs? Net benefits from jobs are defined as the actual wages received less the reservation wages.
4. What are the determinants of programme participation in NREGS?

We examine the above questions in Chitradurga district in Karnataka where the programme has been in place for the maximum period of time (it is a phase 1 district).

We evaluate India's flagship rural employment guarantee programme, the MGNREGS, by answering questions such as whether the MGNREGS wages have been above their reservation wages. Furthermore, we estimate the reservation wages as a function of individual and labour market characteristics, being the first study to do this in the Indian context and compute net benefits from MGNREGS jobs. Next, we understand what demand-side (individual) and supply-side (programme) characteristics determine enrolment in the programme and determine NREGS wages.

Using data from extensive primary surveys of MGNREGS beneficiaries and non-beneficiaries in Chitradurga district of Karnataka, we find that the wages NREGS beneficiaries got were well below than their asking wage (which was Rs.207 a day), being only Rs.98 on average. The estimation of reservation wages shows that higher current wages increase reservation wages. The elasticity of reservation wage with respect to work experience is negative.

We estimated a two-step regression model to understand the determinants of participation in the programme and of NREGS wages. We conclude that the programme has had a favourable impact on reducing rural poverty.

Why do we study Karnataka?

In terms of unmet demand for NREGS jobs, Karnataka is below the national average, with 15% households seeking a job, but not getting one. Furthermore, roughly only more than half of the households who got a job card actually found work under the programme in this state.

Another motivation for studying Karnataka's NREGS stems from a pilot social audit of National Rural Employment Guarantee Act 2005 (NREGA) in Gulbarga district, carried out in July 2008 by Public Affairs Centre at the behest of the Department of Rural Development and Panchayat Raj, Government of Karnataka. The pilot social audit involved five steps, each using a specific instrument, viz., audit of record maintenance at the GPs; assessment of the awareness and constraints of GP functionaries pertaining to NREGS; beneficiary feedback on the effectiveness of NREGS through household surveys; qualitative feedback on the NREGS implementation through Community Group Evaluation Meetings; and physical verification of works and assets to ascertain both the nature and quality of assets created under NREGS. The study found that the GPs are only partially compliant to the mandated requirements of NREGS record keeping. The interviews as part of the second step showed the severe work load caused by NREGS and highlighted the lack of dedicated personnel as one of their main constraints in the effective implementation of NREGS. The survey also revealed other problems such as delay in payment of wages reported by about 60% of the beneficiary households. 54% of all the households surveyed opined that migration out of their respective villages had decreased over the last two years. Participation in NREGS works without job cards was reported in all the GPs save one.

Therefore, Karnataka's case under the NREGS is intriguing to investigate further, such that other similar states can learn from this research. Furthermore, other countries that have similar employment guarantee programmes can learn from this study for useful lessons and pitfalls.

The primary methodology to do this study was extensive primary surveys of beneficiaries, along with secondary data found up to the village (called the Gram Panchayat) level on the NREGS website (http:/nregs.nic.in) on a variety of indicators including wages paid and man hours spent.

Thus our evaluation focuses on important objective of the programme – rural poverty alleviation and 'prevention' of rural-urban migration.

Literature Review

There is an extensive body of literature which examines India's NREGS since its inception in 2005 and its impacts on employment, income, quality of living, migration and its governance.

Social audits are good tools to expose the corruption that plagues programmemes such as the MGNREGS. There have been several social audits of the programme, most notably by the Comptroller and Auditor General (CAG).

The CAG (2013) did a performance audit of the NREGA in 6 districts of Andhra Pradesh, and reported an improvement in income, change in expenditure pattern, increase in bargaining power, which were accompanied by a reduction in migration to urban areas. In the context of Andhra Pradesh, Mukherji (2014) reports an interesting finding that while in other states, corruption is rampant, in this state, the poor and the excluded demanded and obtained work through the scheme, which highlights the triumph of citizen formation.

The CAG's 2008 audit (with its scope being the 200 districts covered by the first phase of the NREGA since February 2006) pointed to the far-reaching ramifications of the lack of administrative and technical staff dedicated to the implementation of this gigantic programme. This audit reported that few states had appointed full-time programme officers at the block level.[5] Another disturbing finding by the CAG was the non-payment of minimum wages, something that "defeats NREGA's objective of providing livelihood security". The report also indicted state governments for effectively scuttling the payment of unemployment allowances. The CAG's finding that the distribution of job cards was incomplete in 74 out of 513 of the surveyed GPs suggests that it was actually complete in the remaining 439 panchayats, a success of sorts given the scale of the operation involved.

While a report from Andhra Pradesh by Aakella and Kidambi (2007) on the use of the audit in the employment guarantee scheme found gaps and leakages, and deviations in the wage amounts paid to the labourers, as opposed to what was stated in the records, Niehaus and Sukhtankar (2013) specifically quantified the magnitude of the leakage due to corruption -- that marginal leakage with respect to an increase in the statutory daily wage due to workers was 100%: none of the wage increase was passed through to workers, even though, on average, they were over-paid prior to the change. This paper posed a reservation wage question to respondents in the context of NREGS work, similar to what is done in this paper.[6]In their restricted sample (1,938 households in the eastern state of Orissa who were listed in official records as having participated in the NREGS between March and June of 2007), 89% of workers reported receiving a wage at least as high as their reservation wage, with the other 11% representing measurement error. The paper found a positive impact of the respondent's reservation wage on their NREGS wage, as we would expect. The optimistic part of their result is that NGOs could play an

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[5] A block is a district sub-division which is next to the Taluk level of administration. A taluk may consist of one or more number of blocks. A block represents a smaller geographical area for which effective plans are prepared and implemented through village panchayats.

[6] Their empirical measure of reservation wages was the subjects' response to following question: "Think about when you requested work. What is the lowest daily wage you would have been willing to work on NREGS for at that point?"

important role in lowering marginal leakage by providing literate advocates, who better understand how to navigate through the bureaucracy, or have better access to the press than individual participants, or serve a coordinating function among the workers.

Given the CAG, in its audit, focused only on certain aspects of implementation, Siddhartha and Vanaik (2008) pointed that the temptation to view the CAG (2008) report as the last word on the NREGA must be avoided.

Irrespective of the extent of leakages in the payment of wages, one basic indicator of the success of a demand-driven programme would be its coverage of those asking for work. Since there is a record of those asking for work but who did not get it, it becomes easier to judge the quality of the guarantee element in MGNREGA, its most powerful distinguishing feature. An analysis of the National Sample Survey data for 2009-10 by Dutta et al (2012) confirmed expectations that while the poorer Indian states had more demand for work under the scheme, considerable unmet demand for work was found in all states. Nonetheless, they concluded that the scheme was reaching the rural poor and was attracting poor women into the workforce.

Vatta, Grover and Grover (2012) performed a temporal analysis of implementation of NREGA in the districts of Hoshiarpur, Jalandhar, Amritsar, Ferozepur and Mansa in the agriculturally prosperous Punjab during 2008-9 to 2010-11, measuring the extent of manpower employment generated under NREGA, its socio-economic characteristics and gender variability in all the districts implementing NREGA since its inception in the state. It compared wage differentials between NREGA activities and other wage employment activities. The results based on the data collected from 200 beneficiary and 100 non beneficiary households revealed that the beneficiary households got employment under NREGA programme for 54.15 work days per annum per household amounting to almost 25% of the total employment opportunities of these households. Due to relatively less access to the wage opportunities in the non-farm sector, beneficiary households showed higher participation in the NREGA activities which enabled them to supplement their meagre incomes. Based on the results of a regression analysis, it was found that

family size, asset value, household income other than NREGA and stage of implementation of NREGA in the district, were significant determinants of household level participation in NREGA. Keeping in mind the present number of job seekers and their future growth, the paper concluded that employment opportunities under NREGA have to be increased by nearly 11 times in Punjab.

It is common sense that lack of information decreases the ability to benefit from any programme, whether it targets employment or poverty. Shankar, Gaiha and Jha (2011) assessed the relationship between information the programme's beneficiaries had, and the efficacy of NREGS in three states. Based on their research, they suggested that the link between information, corruption and the delivery of the programme was not straightforward. The reason they offered was that information not only increases the possibility for the programme to be accessed by those who are not its primary targets, but also increases the efficacy of delivery of the programme to them.

Other studies also support the important role played by programme information on participation. A study by Shariff (2009) based on a survey of 3,200 poor households about the government's safety net programmes in sixteen most deprived districts in northern parts of the country, identified factors supporting access and use of the NREGS. These data evaluated both NREGS accessibility/enrolment and number of days of employment received per household. The econometric analysis suggested that social variables influenced NREGA enrolment in the expected direction, for example, that the casual labour and illiterate households have easy enrolment into the scheme. The study found that the scheme is accessible to households belonging to all caste and religious communities suggesting that it is adequately broad-based although one expects the Scheduled Castes (SC) and Scheduled Tribes (ST) to show greater access. Important is that fact that governance variables such as participation in *panchayat* meetings and having an opinion about transparency in *NREGA* meeting had a favourable impact on the choice of *NREGS* work. The analysis suggested that *programme information* and *having-a-view* on institutions that promote participation are important to determine enrolments. It was puzzling to find that the relatively better-offs had high accessibility to the scheme

than the poor at whom the programme was targeted. One possible reason for this finding is that since the *NREGS* wage in a number of states is higher than local wage rates, the beneficiaries are the regular wage workers, and not necessarily those abject poor whose reservation wages are low. The model corrected for selection bias evaluated the mean number of days of employment conditional upon a household getting enrolled. Limited numbers of variables showed significant effects; Labour force living in *pukka* homes maximized getting *NREGS* employment days. Another dominant effect emerged from a community level factor namely, institutional participation of woman in the village; followed by significant (less than 5%) and unexpected effect from those reporting fair food adequacy. Finally, households having a migrant family member showed a high degree of incapacity to maximize *NREGS* employment days.

In addition to the role played by (lack of) information, part of the reason why employment programmes may not meet the demand for work could be inadequate expenditure. Chakraborty (2007) reported the fact that the government of India's direct expenditure on rural employment constituted 0.2 per cent of GDP in 1996-97, which declined to 0.13 per cent of GDP in 2001, at a time when human deprivation increased in rural India. Thereafter, although there was an increase in the direct expenditure on rural employment to 0.40 per cent of GDP, it tended to decline and fell to 0.33 per cent of GDP in 2006-07, even with the introduction of the NREGS programme. In other words, in the past even without the NREGA, the government had allocated a higher amount of resources in terms of proportion of GDP for rural employment programmes.

As Klonner and Oldiges (2014) pointed out in an excellent literature survey, several recent papers have assessed the NREGA's labour market effects on a national scale econometrically. Studies using National Sample Survey data on employment (Azam, 2012; Imbert and Papp, 2013; Zimmermann, 2012; Berg et al. (2012), who use agricultural wage data from the Indian Ministry of Agriculture, found that the Act resulted in increases in agricultural wages, especially benefitting the vulnerable groups such as females and scheduled castes and scheduled tribes. While rural wages and rural consumption are likely to be positively correlated, particularly among India's rural poor

(as pointed by Lanjouw and Murgai, 2009; Berg et al., 2012), increases in agricultural wages are a second order, general equilibrium effect of a public employment programme, which Klonner and Oldiges (2014) examined with a regression discontinuity design. They estimated NREGA programme effects during 2007 and 2008, combining regionally coded data from consumption surveys with information on the district-wise rollout of the programme. They found large, season-specific effects among a sub-group of the rural population (which accounted for thirty percent of the country's rural population) whose incomes were dependent on agricultural wage labour. They found that for this group of households, employment opportunities under the programme, decreased poverty during the agricultural lean season by half (the original target of the programme), while they found no effect during the agricultural peak season (to be expected). In a cost-benefit analysis they found that, while consumption among this group of households had previously exhibited severe systematic seasonal fluctuations, post-programme, consumption increases among this group of households were of the same order of magnitude as the wage outlays of the programme. They concluded that the employment programme has had a lasting effect on reducing variations in consumption across agricultural lean and peak seasons.

Being a large programme impacting rural India, the NREGS intended to improve the overall quality of living of those who participated. A study by the Institute of Applied Manpower Research (2009) commissioned by the Planning Commission intended to assess the impact of the scheme on the overall quality of life by assessing parameters such as impact on income – earning levels of each household, expenditure on food and non-food items, household and cultivable assets creation by the beneficiaries. The study was carried out in 20 districts spread throughout India by targeting 300 beneficiaries from each district. This study found that contrary to the general perception of better wages upon migration, 70 percent of the beneficiaries revealed that the migration is only for fair wages and not for any better wages. This implies that there is a distress migration for just minimum wages to eke out the livelihood and for survival.

However, other studies show similar findings -- Chakraborty (2007) indicated that the existing institutional arrangements in poorer states are not good enough to implement the NREGA in an effective manner. Shah (2007) highlighted how for NREGA to be able to realise its potential, the role of civil society organisations is critical. Amastha, Shankar and Shah (2008) suggested better staffing, better use of information technology and greater participation of civil society, for better functioning of the NREGA.

Jacob (2008) examined if NREGA had an impact on rural urban migration and if so, what its impact could be. The paper also looked into new anti-corruption and pro transparency steps taken by the Tamil Nadu state government such as biometric cards and rural ATMs. Three blocks were selected for the study. During the study, it was found that there was a lack of accurate official data on migration. Hence, it was not possible to quantify rural-urban migration accurately.

Based on a survey of the literature, we thus find that studies are lacking as far as the comparison of NREGS wages with their reservation wages are concerned, except the one by Neihaus and Sukhtankar (2013). This is the first study to estimate the reservation wages and estimate net benefits from jobs created in the context of NREGS, taking the case of Chitradurga district in Karnataka. We also find that few studies have examined what determines enrolment in the NREGS programme, and for those who are enrolled, what explains the wage they get, in a two-step procedure, taking into account the biases that arise. We accomplish both these objectives in this paper.

Methodology and Scope of the Study

We surveyed 800 NREGS beneficiaries and 200 non-beneficiaries (as a control group) in Chitradurga district of Karnataka. We selected the district with the highest wage rate in Karnataka for this research so that we could examine reservation wages and their impact on migration to urban areas and their poverty. We selected Chitradurga district which has the highest average wage rate in the state. Selection of this district is done by using the secondary data of districts for the year 2010-11 in the NREGA website. We selected all

the six taluks[7]/blocks from Chitradurga district for the study. We developed separate structured questionnaires for NREGS beneficiaries and non-beneficiaries.

We selected those who had completed 100 days of work under NREGS as beneficiaries and those who had not worked as non-beneficiaries. We downloaded the list of beneficiaries who completed 100 days of work in six taluks from the NREGA website (nrega.nic.in) and randomly chose beneficiaries who, on paper, had availed 100 days of work. As shown in Table 1, there were 8,417 beneficiaries in Chitradurga district. We used the proportionate to the population size (PPS) method to select the 800 beneficiaries across the taluks. Similarly we used the same method to select the GPs in all taluks.[8] Within each taluk, GPs were selected geographically across the taluk by using the taluk maps. We selected 200 non-beneficiaries in the same GPs. We selected 33 non-beneficiaries in each taluk and 35 in Challakere taluk so as to get 200 non-beneficiaries. To select the beneficiaries within the GPs, we arranged the list of beneficiaries according to the serial number available in the NREGA website and then used the systematic random sampling method by generating the random number.[9]

[7] A taluk (also called as a tehsil or mandal**),** is an administrative division of India denoting a sub-district. Taluks typically consist of multiple villages and a few towns.

[8] We selected 8 GPs in Challakere, 5 GPs in Holalkere, 7 GPs in Chitradurga, 6 each in Hosdurga and Hiriyur and one GP in Molakalmur. In all, we selected 33 GPs out of 185 GPs in the district.

[9] The field survey was done by an NGO GRAMA and it was closely monitored by the research team through spot checks, back checks and on-site scrutiny of the data collection instruments. SPSS was used for analysis.

Table 1: Beneficiary and non-beneficiary selection for primary surveys

Block	Number of households which completed 100 days	% total	Sampled beneficiaries	Total number of GPs	% total	Number of Selected GPs	Number of selected non beneficiaries
CHALLAKERE	6,570	78.06%	624	39	21.08%	8	35
HOLALKERE	813	9.66%	77	29	15.68%	5	33
CHITRADURGA	583	6.93%	55	36	19.46%	7	33
HOSDURGA	209	2.48%	20	33	17.84%	6	33
MOLAKALMURU	157	1.87%	15	16	8.65%	1	33
HIRIYUR	85	1.01%	9	32	17.30%	6	33
Total	8,417		800	185		33	200

SC/ST participation rates in the MGNREGS at the national level are significant. It would have been instructive to examine how these compare with Chitradurga. Andhra Pradesh, for example, has bypassed Panchayati Raj Institutions (PRIs) substantially to deliver well, which is disliked by those who favour decentralization. However, those who believe that village governments are the stronghold of caste oppression think decentralization is the way to go. Given Karnataka has powerful village governments, it may have been instructive to examine whether this has a negative impact on MGNREGS implementation because the programme is routed through PRIs in the state. However, since we did not gather data in the questionnaire regarding SC/ST status of beneficiaries, we are unable to examine these hypotheses here. Manor (1999) found that PRIs increase the efficiency of service delivery but the services were biased towards the upper caste groups. Hence, whether or not PRI management leads to a situation where non-participation is driven by lack of awareness, are questions which are beyond the scope of this paper.

Findings

We first describe the characteristics of the NREGS beneficiaries and non-beneficiaries whom we surveyed (see Table 2). While we intended to survey 800 beneficiaries, we sampled 6 more, i.e., 806, to account for non-response. On average, the NREGS beneficiary is older and has a larger family size than that of the non-beneficiary. The proportion of females in the NREGS beneficiary sample is larger than that in the non-beneficiary sample, which implies that women tended to benefit more from the programme. This is a major MGNREGS contribution because women have always been paid less than men in farms and construction sites. Nearly 35% of beneficiaries do not have any schooling whereas only 21% of non-beneficiaries had no schooling. These findings are consistent with what Shariff (2009) reports. One-fifth (20%) of beneficiaries, compared to a much larger proportion (27%) of non-beneficiaries, lived in kaccha houses. More than 3 of the average family size of 5 in both the groups were workers (including male, female and child workers).

Table 2: Socio-demographic Characteristics, NREGS and non-NREGS Beneficiaries, Chitradurga

Characteristics	All	Mean, NREGS Beneficiary	Mean, Non-beneficiary	Statistically significant difference?
Number of observations	1,006	806	200	
Mean age (in completed years)	40.77	41.80	36.63	Yes
Family size	4.89	4.93	4.71	Yes
Number of children in household	1.47	1.51	1.31	Yes

Proportion male	60.1%	57.4%	71%	Yes
Proportion with no schooling	32.3%	35.2%	20.5%	Yes
% Kaccha houses	21.2%	19.9%	26.5%	Yes
Total workers in the family	3.36	3.35	3.36	No
Monthly household expenditure	2,623.83	2,666.41	2,450.25	Yes

While 71% of beneficiaries were agricultural labourers, a majority (71%) of non-beneficiaries were household workers. More than 95% of both groups did not have a subsidiary occupation at the time of the survey. Most of them (more than 60% in both cases) came to know of the NREGS through Panchayat members, although a greater proportion (20%) of the beneficiaries came to know through Panchayat officials. Only 7% of non-beneficiaries came to know of the programme from Panchayat officials.

Nearly all of NREGS beneficiaries had received the job card. Nearly two-thirds of all beneficiaries had the names and photographs of all the adult members of their household entered in the job card. While 92% of beneficiaries were aware that they had the right to demand work under the programme, only 14% of non-beneficiaries were aware that they had this right! This shows that the lack of awareness on the part of non-beneficiaries was possibly the primary reason why they were excluded from the programme. More than 90% of beneficiaries had applied to the Panchayat for NREGS work during 2010-11.

As described earlier, one of our objectives was to determine what the NREGS beneficiaries do apart from their NREGS work, and the proportion of time in their schedule, NREGS work forms. We find that even on average, for 98%of workers, NREGS work was their main source of living. Table 3 demonstrates this. At the minimum, two-thirds of their time in a day was spent on NREGS work. This reinforces the view that these workers needed the NREGS job much. While households who

completed 100 days of work are taken as beneficiaries, the minimum days of work for the beneficiaries is 66.67; this shows many beneficiaries actually availed less than 100 days of work.

Table 3: NREGS Work as Part of Total Work

	Observations	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
NREGSwork	806	66.67	100	98.13	5.16

Given the sample that engaged in other work was itself quite small, we studied what occupations they were engaged in, when they were not doing NREGS work. As we would expect, a majority were engaged in agricultural or household work. Further, while the NREGS mandates 100 days of work in a year, beneficiaries desired much higher, about 230 days of work on average, with some demanding all 365 days of work. On average, the number of days worked under NREGS was 90. Interestingly, nearly two-thirds (65%) of workers whom we surveyed were unemployed prior to their NREGS job.

We were interested in examining if the NREGS job created hysteresis in the labour markets. Hysteresis, a term borrowed from physics and applied to the labour market, is used to refer to the short and long-run impacts of a one-time shock such as an employment guarantee programme, which is what NREGS is (see Bartik (1991) for an application of this to the U.S. labour market). We found that while a majority (80%) of the NREGS beneficiaries whom we surveyed were of the view that the skills they learned on the NREGS job did not help in any way in their jobs after the NREGS job, 20% had learned various skills such as agricultural work, flooring, drought proofing, irrigation, road construction and related works. We found that a majority (more than two-thirds, 69%) of NREGS beneficiaries were engaged in agricultural labour, after the completion of their NREGS job, which lends support to the hysteresis effects created by the NREGS jobs. An additional 10% engaged in household work after their NREGS job. These findings are consistent with a recent study on a survey of 4,881 users of more than 4,100

works created under the Mahatma Gandhi National Rural Employment Guarantee Act in Maharashtra by Ranaware et al (2015), which found evidence that MGNREGA works supported agriculture, and benefitted a large number of small and marginal farmers, with an overwhelming 90% of the respondents considering the works very useful or somewhat useful, while only 8% being of the view that they were useless.

Reservation wages and NREGS wages

The reservation wages of a person is his/her asking wage, not his/her current wage; it is hypothetical and is the lowest wage at which he/she would be willing to accept a new job.[10] We were interested in finding about the reservation wages because there is a perception in India's urban areas (specifically the real estate and the construction sectors) that NREGS has driven the labour back to rural areas and has created shortage of required labour in the urban areas.

What we found is interesting. We found that the asking wage of the beneficiary who had completed an NREGS job was Rs.207 a day, whereas the asking wage of the non-beneficiary (200 respondents of whom we surveyed as a control group) was only Rs.185 on average (Table 4). The difference, we found, was statistically significant. The fact that MGNREGS wage is less than the reservation wage tells us the extent of rural distress because people participate.

[10] This is the question we asked in the survey to obtain estimates of the reservation wage, consistent with other well-renowned data sets such as the Panel Study of Income Dynamics (PSID), which is published by the University of Michigan's Survey Research Centre: "What is the lowest take home wage you are willing to accept in your next job?" Also, see Haurin and Sridhar (2003) for estimates of reservation wages, based on this question from the PSID. However, we do agree that reservation wages based on labour market responses of workers may be biased for various reasons, as pointed by Hofler and Murphy (1994): They may engage in wishful thinking and may respond with a wage higher than that which would be necessary to entice them to take up a new job. It may be difficult to control for all characteristics that a job may possess, in a survey. However, many studies (for instance, Jones (1989)) suffer from this problem. Abandoning the question for this problem would be equivalent to throwing the baby out with the bathwater.

Table 4: Daily Reservation Wages, NREGS Beneficiaries and Non-Beneficiaries

Type	Mean	Minimum	Maximum	Std. Deviation	Observations
Beneficiary	207.15	50	300	45.098	806
Non beneficiary	185.40	50	350	46.655	200
Total	202.83	50	350	46.212	1006

Thus, the reservation wage of the NREGS beneficiaries was well above that of the non-beneficiaries whom we surveyed, which is consistent with what other studies on reservation wages show. The wages the beneficiaries got under the NREGS were well below than their asking wage, being only Rs.98 on average. Table 5 presents the distribution of wages male, female and all NREGS beneficiaries received.

Table 5: Daily NREGS Wages by Gender

	Mean	Minimum	Maximum	Std. Deviation	Observations
Male worker's wage	98.26	40	150	7.64	463
Female worker's wage	98.22	50	100	7.15	343
All workers' wage	98.24	40	150	8.56	805

Tables 4 and 5 lend credence to the fact that while the NREGS wages were themselves lower than the workers' reservation wages, the asking wage of the NREGS beneficiaries was higher than that of the non-beneficiaries. This is consistent with the past literature on reservation wages which shows that the past wage increases the asking wage (see Haurin and Sridhar (2003) for instance).

Econometric model

Here, we explain the rationales (with hypotheses) for the control variables included in the estimation of reservation wages. This is similar to its treatment in other studies (see Jones (1991) Haurin and Sridhar (2003); Socio demographic characteristics such as the age, gender, marital status and education determine an individual's asking wage. We expect older individuals, men, and those with kids (which we take as an indicator as those who are married, which is a reasonable assumption to make in the Indian cultural context) to have lower asking wages due to their respective situations of being older in the labour market, the primary bread winners for the household and larger household size and corresponding responsibilities.

Labour market characteristics such as education, work experience, and past wages are expected to impact the reservation wages positively, since higher past wages increase the individual's asking wage, as would the higher levels of education and work experience. The dummy for NREGS beneficiary is meant to control the impact the programme has on the asking wage of such individuals, and we expect it to have a positive impact, consistent with the experience of the programme thus far and the complaints received from the construction and real estate sectors in urban India. The local unemployment rate is expected to impact the individual's reservation wage because the rate at which economic opportunities arise, is determined by an area's unemployment rate, as Bartik (1991) argued. Thus, the higher the local unemployment rate, the more difficult would it be for job opportunities to come by, the more rigorously the individual would search for job openings and less likely to quit a job if he/she obtained one. For these reasons, an individual's reservation wage would be lower in a high unemployment area and vice-versa.

This is also the first study to estimate reservation wages in India's context. In the past, other studies (most notably Sridhar (1996) and Haurin and Sridhar (2003)) have estimated the reservation wages as a function of the local unemployment rate and

respondent characteristics for the United States (using data from the Panel Study of Income Dynamics).

The significance of understanding the relationship between reservation wages and the unemployment rate is because economic rent (or net benefits) from a job is defined for every individual as the wages paid minus the reservation/asking wage. Hence the lower the reservation wage, the higher would be the economic rent from a job for any given individual, holding wages constant.

In the context of the NREGS, an assessment and estimation of reservation wages would then help us to answer two questions:

1. Whether individual workers' reservation wages are higher or lower than the NREGS wages being offered, since this has implications for migration; if the individual's asking or reservation wage is higher than the NREGS wage, then we assume that NREGS is not successful in checking migration.
2. What are the economic rents or net benefits from jobs created under the NREGS? This will help to design policies such that we may maximize economic rents from jobs created under the NREGS, especially for the poorest families.

Equation (1) summarizes the econometric model chosen to estimate the reservation wage.

$w^r_i = \alpha_0 + \alpha_1$ age $+ \alpha_2$ age squared $+ \alpha_3$ education $+ \alpha_4$ education squared $+ \alpha_5$ work experience $+ \alpha_6$gender $+ \alpha_7$ children $+ \alpha_8$ children squared $+ \alpha_9$unemployment rate $+ \alpha_{10}$past wage $+ \alpha_{11}$whether NREGS beneficiary$+ e_i$ ----------[1]

Estimation of reservation wages

An important contribution of this research is to estimate the individual's reservation wages as determined by socio-demographic characteristics, so that we can predict what an individual worker's reservation wages would be, given his/her and the labour market

characteristics. These would be useful from a policy perspective to set minimum wages in an equitable manner.

Using the micro-level surveys of NREGS beneficiaries and non-beneficiaries that were conducted, we estimated the reservation wage as a function of various individual and labour market characteristics in equation (1) with relevant variables in log form, consistent with other studies.

Table 6 summarizes the parameter estimates of the dependence of the reservation wage on various characteristics and the local unemployment rate in the areas of our survey.

Data on the local unemployment rate in the villages of our survey was obtained from the Census of India Primary Census Abstract at the village level, which had information on total, main and marginal workers. The local unemployment rate for every GP was computed as the ratio of marginal workers to total workers (consisting of main and marginal workers), given marginal workers are those who worked at least for 3 months in the year, and were looking for work. We considered 'non-workers' as those who are out of the labour force (housewives, retired, students, children and others).

Table 6: Estimation of Reservation Wages

(Dependent Variable: Log of Reservation Wage)

	Parameter estimate	**Std. Error**	**t**	**Significance**
Constant	5.02***	0.14	36.66	0.00
Gender (1=Male; 0=Female)	0.13***	0.02	7.77	0.00
Education (Highest grade of school completed)	0.01	0.02	0.98	0.33
Education-squared	-0.01*	0.00	-1.85	0.07
Age of the beneficiary (in completed years)	0.02*	0.01	1.74	0.08
Age-squared	0.00	0.00	-1.28	0.20
Type (NREGS beneficiary (1) or non-beneficiary (0))	0.07	0.04	1.92	0.06
Number of children in the household	0.08***	0.01	5.92	0.00
Children-squared	-0.01***	0.00	-3.21	0.00
Log of current wage	0.04**	0.02	2.18	0.03
Log of work experience	-0.21***	0.09	-2.44	0.01
Unemployment rate	.000	.000	-.450	.653

***Statistically significant at the 1 percent level.

**Statistically significant at the 5 percent level.

*Statistically significant at the 10 percent level.

Number of observations=1,003

Adjusted R-squared=0.16

Table 6 shows that the gender has a statistically significant and positive impact on the individual's reservation wage. Contrary to expectation, men have higher reservation wages to the extent of Rs.0.13 when compared with women. This could be the flip side of them being the primary income earners in the household. While education has an insignificant impact on the individual's reservation wage, education squared has a negative and significant impact. This implies that, at higher levels, education has a negative impact on the individual's asking wage. This implies that education has a peaking effect on the reservation wage at some point, after which it starts to impact the reservation wage negatively. Age has a positive and significant impact on the reservation wage, which shows that older individuals have higher asking wages to persuade them to trade their leisure with NREGS work, not as per our expectation, but nonetheless plausible.

The number of children in the household impacts the reservation wage of the respondent positively. This implies that higher number of children who need to be supported increase the individual's asking wage. Specifically, for every extra child that the household has, there is an increase to the extent of Rs.0.08 in the reservation wage of the respondent. Similar to what we find with education, the number of children squared has a negative and significant impact on the reservation wage, which means that once children are grown up, they may leave the household, even support parents with their income, hence this impacts the reservation wage negatively.

We examined the impact of labour market characteristics such as the unemployment rate, the respondent's past wage, and work experience on the individual's reservation wage. The estimate of the log of current wage on the asking wage implies an elasticity of less than 1, nonetheless, is positive and significant, as we would expect and is consistent with what several other earlier studies have found.[11]This means that higher current wages increase reservation wages.

[11] The equation is in double log form, hence the coefficient is interpreted as an elasticity.

The elasticity of the reservation wage with respect to work experience is negative, implying that higher work experience lowers actually the individual's asking wage, keeping education and other characteristics constant. The local unemployment rate for the GP (which was for 2001) has no impact on the reservation wage although we would have expected a negative impact, as Sridhar (1996) finds. While the insignificant impact of the unemployment rate on the individual's reservation wage is consistent with other studies which examine the issue (e.g. Haurin and Sridhar (2003); Prasad (2003)), one reason for this finding in the Indian dataset could be that there is not as much variation in the unemployment as we would like, since it is the same for all respondents within a GP.

We computed net benefits for jobs created under the NREGS, using estimates of the reservation wages we obtained for NREGS beneficiaries. The net benefit was computed as the difference between the daily wage they earned in the NREGS and their reservation wage. A positive net benefit shows that NREGS has benefited him/her, since the actual wage he/she received was higher than what they expected. On the contrary, a negative net benefit shows that even the NREGS was unable to meet their expectations regarding the wage. Table 7 presents summary statistics for the net benefits for the beneficiaries from their NREGS job.

Table 7 shows that on average, the net benefits from NREGS jobs are negative. This implies that the wages from NREGS job were well below the reservation wage, even on average.

When we examined a frequency distribution of the net benefits from jobs (Table 8), it was even more apparent that only one percent of the sample reported positive net benefits. For 99percent of the sample, the net benefits were either negative or zero at best. This defies any myth that NREGS is preventing workers from migrating to rural areas, based on the necessarily wrong assumption that migration is 'bad'.

Table 7: Net Benefits from NREGS Jobs (in Rs.)

Mean	-109.87
Std. Deviation	41.93
Minimum	-200.00
Maximum	20.00
Sum	-88555.00

Number of observations=806

Table 8: Frequency Distribution of Net Benefits from NREGS Jobs

Net benefit (in Rs)	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
-200.00	36	3.6	4.5	4.5
-180.00	5	.5	.6	5.1
-175.00	1	.1	.1	5.2
-170.00	1	.1	.1	5.3
-150.00	236	23.5	29.3	34.6
-130.00	9	.9	1.1	35.7
-125.00	1	.1	.1	35.9
-120.00	5	.5	.6	36.5
-100.00	346	34.4	42.9	79.4
-90.00	1	.1	.1	79.5
-80.00	19	1.9	2.4	81.9
-75.00	3	.3	.4	82.3
-70.00	10	1.0	1.2	83.5
-60.00	1	.1	.1	83.6
-50.00	103	10.2	12.8	96.4
-30.00	17	1.7	2.1	98.5
-20.00	1	.1	.1	98.6

.00	6	.6	.7	99.4
10.00	4	.4	.5	99.9
20.00	1	.1	.1	100.0
Total	806	80.1	100.0	

What determines participation in the programme?

We performed a two-stage regression of the status of participation in the NREGS programme, based on our micro-level surveys and the wages the beneficiaries received. We noted that NREGS wages are observed only for beneficiaries and are not observed for non-beneficiaries. If we did not control for such a selection problem, we will get biased estimates of the wages. Hence, a correction procedure is required (Fishe (1982)). Our sample matches this case, and we use a technique described by Maddala (1983) that has been subsequently used by many studies (Hui (1991); Haurin and Sridhar (2003)). To correct the selection bias, we estimated a two-step regression model.

In the first stage, we performed a probit estimation of whether or not a respondent is an NREGS beneficiary or not. This was assumed to be dependent on both demand-side and supply-side characteristics. Demand-side characteristics are individual's characteristics such as age, gender, education, measures of need (which are reflected in monthly household expenditure), number of children and the reservation wage. Supply-side characteristics are per capita programme expenditure and the percentage of delay in disbursal of wages to beneficiaries. Table 9 presents our findings from the first step of the two-step regression.

Table 9: What determines participation in NREGS? Probit Estimates

Parameter	**Estimate**	**Std. Error**	**Z**	**Sig.**
Education	-.052	.028	-1.876	.061
Age	**.035*** **	**.005**	**6.892**	**.000**

Monthly household expenditure	.000	.000	.328	.743
Percent delay in payment of wages	**.024*** **	**.003**	**8.132**	**.000**
Reservation wage	**.012*** **	**.001**	**10.834**	**.000**
Gender (0=female;1=male)	**-.670*** **	**.104**	**-6.469**	**.000**
Number of children in the household	.001	.035	.027	.978
Per capita programme expenditure	**.000*** **	**.000**	**-8.415**	**.000**
Intercept	**-3.486*** **	**.370**	**-9.421**	**.000**

Dependent variable: Whether respondent is an NREGS beneficiary (1) or not (0)

*** Statistically significant at the 1 percent level.

Number of observations=1,006

Chi-squared: 1603.89, significance: 0.000

We find that of the demand-side characteristics, age, gender, and the individual's reservation wages have a significant impact on the respondent's likelihood of participating in the programme. Specifically, older individuals and women are more likely to be beneficiaries, which is a highly positive and desired impact of the programme, and the reservation wage has a positive impact on the likelihood of participation. This implies that those with higher asking wages enrol in the programme since there are expectations of higher (higher than minimum wages) wages in the NREGS programme. It is instructive to note here that Vatta, Grover and Grover (2012) found that household income other than NREGA and stage of implementation of NREGA in the district, were significant determinants of household level participation in NREGA. The measure of need we included, monthly household expenditure, did not have a

significant impact on the likelihood of participation, likely because expenditure is possibly a poor measure of need.

Both the supply-side characteristics have a positive and significant impact on the likelihood of participation in the programme. The per capita programme expenditure has a positive impact implying that the higher is the per capita programme expenditure (for the village in which the respondent is located), the higher is the likelihood of his/her participation. This is to be expected because the higher programme expenditure will send many signals (such as ongoing construction, drainage and other works) to the local community that the programme is functional and it is possible for them to enrol.

The extent of delay in payment of wages also surprisingly has a positive impact on the likelihood of participation. This shows that the workers perceive the payment of wages, delayed or otherwise, as being better than no wages, hence they enrol in the programme. This implies that NREGS must have had some impact on poverty. However, this can be ascertained only through the estimation of NREGS wages on various characteristics, as shown in Table 10, after accounting for the selection bias which arises since NREGS wages are observed only for beneficiaries of the programme.

Table 10: What determines NREGS wages?

Parameter	**Estimate**	**Std. Error**	**t**	**Significance**
Constant	**50.836****	**25.182**	**2.019**	**.044**
Gender (0=female; 1=male)	**-6.929****	**3.107**	**-2.230**	**.026**
Education	2.208	2.667	.828	.408
Age (in completed years)	-1.209	1.510	-.801	.423

Work experience	1.568	1.512	1.037	.300
Unemployment rate of village	-.097	.067	-1.453	.147
Reservation wage	**.149*** **	**.047**	**3.148**	**.002**
Per capita programme expenditure	**-.001*** **	**.000**	**-6.172**	**.000**
Percent delay in payment of wages	**.377*** **	**.124**	**3.042**	**.002**
LAMBDA	**-38.442*** **	**10.851**	**-3.543**	**.000**

Number of observations=1,006

Adjusted R-squared=0.28; F=44.32, significance: 0.000

Table 10 shows some expected findings. It shows that females have higher wages to the extent of nearly Rs.7 a day, when compared with male beneficiaries. The reservation wage has a positive and significant impact on the NREGS wage, as we would expect. For every Rs.1 increase in the person's asking wage, there is an increase of Rs.0.15 in the daily NREGS wage of the beneficiary. The per capita programme expenditure has a negative and significant impact on the NREGS wage, implying that other components of the programme such as public works take precedence over payment of wages. The extent of delay in the payment of wages has a positive impact on NREGS wages, which basically implies that the greater the payment of wages are delayed, the higher would be the wage (with arrears), to be expected.

Finally, the sample selection factor is negative and significant implying that Ordinary Least Squares (OLS) regression would have produced downwardly biased estimates.

Summary, conclusions and caveats

Summarizing all the results we have found here, we find that the wages the beneficiaries got under the NREGS were well below than their asking wage (which was Rs.207), being only Rs.98 on average. We find that NREGS has not had any impact on rural-urban migration, hence presumably has no impact on urban poverty or the urban labour market as has been debated by the construction/real estate sectors.

In the estimation of reservation wages, the estimate of the log of current wage on the asking wage implies an elasticity of less than 1, nonetheless, is positive and significant, as we would expect and is consistent with what several other earlier studies have found. This means that higher current wages increase reservation wages. The elasticity of the reservation wage with respect to work experience is negative, implying that the higher work experience lowers actually the individual's asking wage, keeping education and other characteristics constant.

We computed net benefits for jobs created under the NREGS, using estimates of the reservation wages we obtained for NREGS beneficiaries. We find that on average, the net benefits from NREGS jobs are negative. This implies that the wages from NREGS job were well below the reservation wage, even on average. When we examined a frequency distribution of the net benefits from jobs, only one percent of the sample reported positive net benefits. For 99 percent of the sample, the net benefits were either negative or zero at best. We find that women tended to benefit more from the programme. This is a major MGNREGS contribution because women have always been paid less than men in farms and construction sites.

We draw a two-step regression model to understand the determinants of participation in the programme. We found that demand-side characteristics such as age, gender and the individual's reservation wages have a significant impact on enrolment in the programme, further reinforcing the positive impact the programme has had on women's participation. Supply-side factors such as per capita programme expenditure and the percentage of

delay in payment of wages have significant impact on participation in the programme. In the second step, we estimate the NREGS wages accounting for the selection bias created by examining this only for the beneficiaries. This second step regression shows that NREGS wages are determined by gender (negative impact showing higher NREGS wages for women, which is desirable), reservation wage (positive impact implying those with higher reservation wages get higher wages in the programme), programme expenditure (negative impact implying that higher per capita programme expenditure leads to lower NREGS wages) and percentage delay in payment of wages (which has a positive impact on wages received), which shows the importance of getting wages, whether delayed or on time.

While net benefits from jobs created under the NREGS are negative, when we combine this with the econometric results which show even a delayed payment in wages having a positive impact on programme participation, we conclude that the programme has had a favourable impact on reducing poverty.

What does this imply in terms of policy? This implies that since NREGS wages are much lower than the beneficiaries' asking wage, the NREGS programme itself would not deter the beneficiaries from migrating out of the village. Given the finding that current wages increase the individual's reservation wage, it is possible that the programme itself has increased the beneficiaries' asking wages. However, given the finding that even a delayed payment of wages has a positive impact on programme participation, we conclude that the programme may have deterred participants from migrating out of the village.

Some caveats of the research are that the reservation wages, NREGS wages, and the net benefits from programme are all based on surveys conducted in one district of a single state. Nonetheless, given their impact and policy implications, we recommend such studies be done in all the Indian states, or at least in a nationally representative sample.

Furthermore, this research highlights the importance of knowledge about reservation wages not just in the context of rural employment programmes, but also urban

employment programmes. It is possible to compute net benefits from jobs created as part of regional development programmes and evaluate their nature.

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