

Can the Rural Employment Guarantee Scheme Reduce Short-Term Migration: Evidence from West Bengal, India[#]

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ABSTRACT:

One of the main issues that concerns policymakers and development scholars working in India is the rapid increase of rural out-migration over the past two decades. The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) was passed in 2005 with a view to curb rural out-migration through guaranteed employment in public works. In this context, using a mix of regression analysis and ethnographic evidences, the paper aims to evaluate the impact of the programme in reducing short-term rural migration. Using probit framework, the paper finds no significant impact of household participation in MGNREGS on migration decision. However, if we take number of days of work and annual earnings from MGNREGS as the primary variable, it is found that as the number of days of work and annual earnings by the household increases, its probability, engaging in migration reduces significantly. To account for the possible endogeneity, we make use of bivariate probit technique, probit estimation with endogenous regressors method and two stage estimation methods. But, the test statistics showed no endogeneity enabling us to use simple probit and ordinary least squares estimation methods. The results obtained corroborate with the ethnographic and anecdotal evidences. Further, the results from the regressions are validated through local polynomial smoothing simulations. The findings lay emphasis on better implementation of the programme with planning and vigilance for the households to enjoy its potential benefits including the liberty to stay back and work at their own village.

Keywords: MGNREGS, migration, bivariate probit, endogeneity, impact, West Bengal

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I. Introduction

India has experienced unprecedented growth since the advent of economic reforms in the year, 1991. Structural changes brought about by the economic liberalization policy have propelled growth in the Gross Domestic Product (GDP) that the country has been witnessing over the past two decades. Development scholars and policy makers often hail India as a major growth engine for the global economy along with China (Callen, 2007; Peterskovsky & Schüller, 2010). However, there are serious concerns about the inclusiveness of Indian growth process (Dev, 2008). Studies have pointed out that these concerns are arising mainly due to the persistence of substantial socioeconomic inequalities in various economic as well as non-economic outcomes (Jayadev et al. 2007; Singh, 2012, Singh et al. 2013). This increased economic inequality coupled higher urbanization, better employment opportunities and changing occupational patterns have led to increase in internal movements of labour. According to the Census 2001, 309 million individuals were migrants, which constitutes to about 30% of the total population. Mahapatro (2012) says that internal migration in India has increased from 25% in 1993 to 29% in 2007-08. Deshingkar and Akter (2009) estimated that there are around 100 million circular migrants in India.

The same study by Deshingkar and Akter also emphasized that circular migrations, which involves temporary and repetitive movement of a migrant worker between home and host areas for the purpose of employment is majorly found in poorer and disadvantaged households. Ghosh and Chandrashekhar (2007) indicate that these short-term circular migrations in India has been evidently increasing and driven by distress factors mainly increasing inequalities, inadequate livelihoods and the agrarian crisis.

Coming to the effects of migrations on migrants and the household members who are left behind, Human Development Report (2009) argues that migration helps the households to develop their human development outcomes through the earnings of the migrant. However, studies have also stressed that there is exploitation and exclusion associated with migration. Rao et al. (2006) conducted a survey in Andhra Pradesh and revealed that migrant workers face vulnerabilities in form of lack of social security, lack of access to basic amenities, under payment and exploitation. Mosse et al. (2005) found from the Bhil district of Western India that migration perpetuates debt and dependence and also exposes the poor to extreme hardships and

exploitation. A study by Roy (2011) emphasized that, other than the social consequences of seclusion and dejection, rural migration can also lead to overcrowding in the urban areas and shortage of skilled labour in the rural areas.

Government Schemes and Migration

Due to these negative effects of rural migration and its increasing nature, there is a need to curb rural out-migrations. It is often opined that employment guarantee schemes implemented at the village level can result in reduction of rural out-migrations, caused due to lack of employment opportunities. The landless poor would be able to get employment and the necessary livelihood and hence he might not opt to migrate for better employment opportunities in the urban areas. Further, the improved agricultural productivity, through asset creation and higher wages associated with employment guarantee schemes and public works programme would allow the inhabitants to stay in the village, thus reducing rural migration. However, there is a counter argument which says cash transfers through government welfare schemes may facilitate migration in the sense that low earning households would get the required amount of finance from the programme to pay up for the migration cost (Konig and Wodon 2005).

Considering the above two arguments, there have been significant studies on how government programmes can influence migration. Stecklov et al. (2003) try to estimate effects of PROGRESA, a public funded cash transfers to the eligible households of Mexico, on rural-urban and international migration and finds negative significant effect on international migration.¹ Konig and Wodon (2005) analyze the impact of PROCAMPO in reducing temporary and permanent migration and find that the programme has a negative significant impact on permanent migration at 5% level of significance and even on temporary migration at 10% level of significance.² Silveira Neto and Azzoni (2011) try to evaluate the impact of the Bolsa Familia programme on internal migration in Brazil.³ It is found that the programme significantly reduces

¹ Here eligible households are those with regular school attendance and health clinic visits.

² PROCAMPO is a program of direct payments to the farmers of Mexico, who received fixed payments per hectare devoted to nine crops including maize, cotton and wheat after liberalization of Mexican economy.

³ Bolsa Familia is a conditional cash transfer programme, which provides financial help to families where children go to schools and are vaccinated.

migration but does not contribute to return migration suggesting returning migration cost might be higher than initial migration.

One of the primary objectives of Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), implemented in India from 2005 is to reduce short-term rural out-migration (Dev 2011). Studies and field based reports across different states have indicated that there has been marked reduction of migration since the inception of MGNREGS. Ambasta et al. (2008) found such evidences in Madhya Pradesh. Similarly Menon (2008) and Jacob (2008) found reducing impacts of the programme on migration in parts of Rajasthan and Tamil Nadu.

The studies documented above, though have discussed and elaborated reduction in out-migration due to the impacts of MGNREGS, are qualitative and anecdotal in nature and lays out ethnographic evidences of the same. However, to our knowledge, there have been no quantitative works in this direction. Under this context, the paper seeks to explore both qualitatively and quantitatively, the role of MGNREGS, if any, in reducing short term rural out-migrations. Based on a field survey on 556 households in the Cooch Behar district of West Bengal done, the paper firstly tries to find if participation in MGNREGS by the households leads to reduction in out-migration by any of its members. Further, it explores if the number of days of work has significant impacts in curbing short term out-migrations. Using typical impact evaluation methodology which controls for endogeneity in decision making, the paper finds that participation in MGNREGS has no significant impact in reducing out-migrations. However, it is found that number of days of work under the programme has significant impact in reducing short term out-migration. Also, higher annual income earned through the programme by a household is found to significantly reduce short-term migration. The results from the regression are further validated through local polynomial smoothening simulations.

The structure of the paper is as follows. The next section gives a brief introduction to the programme, MGNREGS and its implementation in the field of study, the Cooch Behar district of west Bengal. The subsequent section discusses about the data used and then moves onto the regression methodology. The penultimate section presents and explores the results from the regression and contextualizes it with ethnographic evidences collected from the field. The last section gives a brief discussion on the results of the study and then ends with a conclusion.

II. MGNREGA and its implementation in Cooch Behar District

Features of the Act

The MGNREGA was passed unanimously by the Lok Sabha on 23rd August 2005. It was implemented in 200 rural districts of India initially on 2nd February 2006 and has been extended to the whole country at present. Under this Act, any adult from a household living in rural areas, willing to do unskilled manual labour at statutory minimum wage is entitled to be employed for at least 100 days a year on public works. One striking feature of the programme is its decentralized nature, where administration and allocation of works are carried out by the elected local authorities of the respective villages.

Adult members of a rural household, who are willing to do unskilled manual work would have to apply for registration in the Gram Panchayat (GP)⁴. After verification of the place of residence and age of the adult members, the household is issued a job card, which is mandatory for households to work under the programme. An application has to be made to the GP or MGNREGA supervisors if the household want work, indicating the time and duration of work. Against this application, the GP has to provide work to the household within 15 days, failing to which an unemployment allowance has to be paid⁵.

Implementation of MGNREGA in Cooch Behar district

Cooch Behar district is situated in the north eastern part of West Bengal, bounded by the state of Assam in its eastern part and Indo-Bangladesh boundary in the southern part. With the highest proportion of Below Poverty Line (BPL) families (51.81%) and agricultural labourer in the state (59.20%), proper implementation of MGNREGS becomes important for higher welfare⁶. Table 1 presents the person days generated in each of the districts of West Bengal over the last 4 years. It is clear that Cooch Behar district has displayed one of the worst performances in terms of

⁴ A GP is the primary unit of the three tier structure of the local self-government in the rural parts of India. Each Panchayat consists of few villages.

⁵ For more information on the programme, please refer Dey et. al (2006)

⁶ This statistic is according to the BPL Survey conducted in the state by Government of West Bengal in 2005. For more information, please refer <http://www.wbprd.nic.in/HtmlPage/bpl.aspx>

implementation. In fact, over the last 3 years, average person-days generated by the district under MGNREGA is lowest in West Bengal. Further, studies have shown that implementation of the programme has been poor in the area in other indicators like denial of work and proper wage to the labourers, providing work to the marginalized sections like Scheduled Castes/ Tribes and women and completed works⁷ (Dey 2010).

[Table 1 about here]

III. Data and Variables

The data used in this paper is collected from a field survey conducted from January to April 2012 in two blocks of Cooch Behar district. Cooch Behar district has among the highest number of migrants in the state among all the districts along with Birbhum. In Cooch Behar, it is found that more than 22% of the households migrate for casual labour.

Two blocks namely the Haldibari and the Cooch-Behar-I block are chosen for survey. In terms of person days generated by the programme in 2010-11, Cooch Behar-I was among the best performing block in the district along with Mathabhanga-II and Tufanganj-II blocks. Haldibari block, on the other hand was among the worst performing block with average person days of less than 8.5 days⁸. From each of these two blocks, two Gram Panchayats (GP) are chosen randomly. From Haldibari block, Dakhin Bara Haldibari and Devanganj are chosen and from Cooch Behar-I block, Dawaguri GP and Falimari GP are selected.

From these four GPs, 556 households are chosen randomly and interviewed. Questions on their socio-economic and demographic characteristics are asked along with information on MGNREGA. Questions like “whether the household sought work in 2011” are asked along with information on the number of days of work in the years, 2011, 2010 and 2009, the wages received and the awareness level about the programme are collected.

7 The report by the Right to Food Campaign also highlights problems in Cooch Behar district. The URL of the report is available at <http://www.indiaenvironmentportal.org.in/reports-documents/report-implementation-nregs-state-its-gaps-grievances-and-demands>

8 Please refer http://164.100.112.66/netnrega/writereaddata/state_out/Empstatusall3208001_local_1011_.html for more details.

The survey collected information on whether any individual of the household migrated in 2011 or 2010 along with the number of months of migration. Apart from this, the survey collected information on the daily earning of the main-earner of the household. Further, the survey contained information on whether the head of the household participates in political meetings, rallies and campaigns.

We postulate that participation in MGNREGS in 2010 has the potential to affect migration decision of the household. This is because a household would expect whether it would get work under MGNREGS or not in 2011 depending on whether it got work in 2010. Similarly the number of days it would expect to receive in 2011 would be according to the number of days of work it got in 2010. This is postulated based on field interviews where most of the interviewers reported that he/she expects the volume of work under the programme according to the situation that prevailed last year. Data shows that this expectation may be true since over 60% of the household who got work in 2010 also got work in 2011 and of the households, who did not work in 2010, 70% also did not work in 2011. Further, the pairwise correlation between the number of days of work in 2010 and 2011 for households who worked in both the years is about 0.58 and is significant at 1% level. Hence we postulate that participation of the household in programme in 2010 would affect its migration decision in 2011. Accordingly, the two primary independent variables of interest in this study are participation in MGNREGS in 2010 and number of days of participation of the household in 2010. Participation is categorized as “1” if any member of the household got work under the programme and “0” otherwise. Number of days of work for every household is calculated by summing up the number of days for each individuals of the household.

Outcome Measures-Getting work in MGNREGA and number of days of work

Since the main objective is to examine how if MGNREGS has any effect in reducing out-migration, the outcome of interest is whether any individual of the household migrated for short duration in the year 2011 (Short term migration). By short term migration, we mean individuals who migrated for more than 1 month but less than 6 months. A household has been categorized as “1” if at least one individual of the household migrated (short-term migration) in 2011 and “0” otherwise.

Independent Variables

Drawing from the published literature on the models of migration and taking into account the Indian context, we have incorporated a number of controls in evaluating the impacts of the programme. These include socio-economic and demographic characteristics of the household. To categorise the households by social group and religion, we use dummies for caste and Muslim households. The categorical variable for caste is coded into three categories-“Scheduled Caste/Scheduled Tribes” (SC/ST), “Other Backward Castes” (OBC), and “Upper Castes” (UC; taken as reference) which represent meaningfully the Indian social fabric along caste lines⁹. Since the two main religions of the survey region are Hindu and Muslims and the sample does not consist of households belonging to any other religion, Muslim dummies are taken with Hindus as the reference group.¹⁰

A number of variables are used to capture the economic condition of the household. Amount of land cultivated and number of livestock are included because they are among the best indicators of wealth status in rural areas. House types are categorized as “non-cemented”, “semi-cemented” and “fully cemented” and are used as separate dummies to assess the economic condition of the household. A dummy like “whether the household possess BPL card” is also incorporated. Further, the main occupation of the household is added to capture its financial health. Apart from these controls, demographic variables like age of the household head and his/her education, the gender, ratio of kids who do not go to school to the household size (below 7 years of age) and the ratio of working age male individuals in the household to the household size are used. To control for the fixed effects at the GP level, GP fixed effects are included. To control village fixed effects, standard errors at village level are clustered in the regressions.

IV. Estimation Methodology

⁹ It may be noted that the SCs and STs along with the OBCs have suffered from severe social exclusion and discrimination from historical times and lag behind the Upper castes in the different indicators of welfare. (Deshpande, 2011).

¹⁰ Hindu is the majority religious group in the Indian population (taken as the reference category) and Muslim is the largest group among religious minorities.

A fundamental problem in the study of impact evaluation of a policy or intervention is that we can only measure the outcome variable of each individual observation along with the fact that whether it received the treatment or not. However, we cannot observe what would have been the outcome had the treatment individual, actually not got the treatment. In other words, the problem of counterfactual remains unrealistic. For example, we can observe if no member of a household, which participated in MGNREGS in 2011 actually migrated in 2010. But it is impossible to determine the migration status had this household not participated under the programme. This counterfactual dilemma has been noted in impact evaluation literature (Rubin, 1974; Heckman, 1991; Angrist and Pischke, 2009).

Formally, we define a dummy variable, D_i which indicates if the household, i participated in MGNREGS in the year, 2010 (1 or 0) for a sample of households, $i=1\dots N$. We also define a binary outcome variable, Y_i which indicates if at least one member of the household migrated for short-term in the year, 2011 (1 or 0). Ideally we are interested in getting the migration status of a household, which participated in the programme relative to the migration status had the household not participated under the programme. If Y_{1i} is the outcome if the household participates under MGNREGS and Y_{0i} is the outcome if the household does not, then the difference, $Y_{1i} - Y_{0i}$, would give us the actual impact of the programme. However, both the observations is impossible to be observed for the same household. By applying different techniques of impact evaluation, this problem can be mitigated.¹¹ In our problem, we find the average treatment effect (ATE) on for a sample of households given by:

$$ATE = E(Y_{1i} - Y_{0i}) \quad (1)$$

To measure the ATE, one can argue that a simple difference in proportion of households where at least one member migrated between those, who participated in the programme and those who did not would yield the unbiased impact if the difference is significant. In this case, even a simple probit regression would also have yielded the unbiased estimations, which would control for all the other factors leading to participation under MGNREGS. The measure of impact, after controlling for the controls as discussed in the last section is determined by the regression

¹¹ Please refer to Khandekar et al. (2010) for an excellent overview of most of the methodologies available.

coefficient for the participation (under MGNREGS) variable. However this may be possible if participation is random or it is exogenous to the decision of migration or it can be conditioned solely on the observables. These may be strong assumptions under many circumstances. In reality, there may be unobservable variables which may affect both, participation in MGNREGS and also migration decisions of the household. For example, variables, which are unobservable to us as researchers are enthusiasm or dynamism. A dynamic or enthusiastic household may opt to participate in MGNREGS as well as allow one member to migrate for better opportunities. But, since we are unable to measure dynamism or enthusiasm, we would not be able control for this unobservable variable. This can give rise to the classic case of the omitted variable bias or the endogeneity problem (Greene 2008; Angrist and Pischke 2009). In such case, participation in MGNREGS would be considered to be endogenous to migration decision of the household. To tackle this problem, instrument variable regression and bivariate probit regression is used.

More formally, to measure the impact of participation under MGNREGS on migration decision of the household, we assume the following function:

$$Y_i = \alpha + \beta X_i + \chi D_i + \varepsilon_i \quad (1)$$

where Y_i is the binary variable that indicates if at least one member of the household migrated for short term in the year, 2011. X_i is the vector of control variables, as discussed earlier which includes household demographic as well as socio-economic variables. D_i is the primary variable of interest, which is a dummy variables indicating if the household participated in MGNREGS in the year, 2010.

However, there are no available regression methodologies, which can model binary or count variable with endogenous binary variable (Angrist et al. 2010, Mont and Nguyen, 2013). Thus we assume a linear structure to the endogenous variable and use linear instrumental variable regression to estimate the model. The “ivprobit” command in STATA gives the required estimates. If equation (1) represents the second stage model with D_i as the endogenous variable, then the first stage equation is as follows:

$$D_i = \delta + \phi C_i + \eta Z_i + v_i \quad (2)$$

where C_i is a vector of exogenous variables which affect participation in MGNREGS by household, i and Z_i is the vector of instruments, which are highly correlated with the participation in MGNREGS but non correlated with the error term, ε_i . Under the assumption of exogeneity, participation, D_i should be uncorrelated with the error term or unobservable error term, ε_i . However, if $Cov((D_i, \varepsilon_i) = \rho \neq 0$ for reasons already discussed, participation under the programme is endogenous.

We also make use of bivariate probit simultaneous equation estimations, which model household participation in MGNREGS and then estimate this equation jointly with the migration decision model.¹² Bivariate probit model allows testing for endogeneity of participation variable to the outcome variable by estimating ρ . If $\rho=0$ then we cannot reject the null of exogeneity and simple probit estimation would be sufficient to gauge the impact. However if $\rho \neq 0$, then endogeneity conditions hold and bivariate estimations can provide consistent estimates of the impacts.

Going one step further, we also evaluate the impact of extent of participation in MGNREGS indicated by number of days of work and annual income earned by the household under the programme in 2010. Assuming the number of days and annual earnings to be exogenous to migration decision, we can simply run a probit regression treating number of days of work to be continuous. However dropping this assumption and also since number of days and earnings is censored at the lower level of 0 (since we do not observe number of days of work and income for households, which did not work under MGNREGS), we run a tobit regression on the number of days of work and then use the estimates to run probit regressions to determine if extent of participation has any impact in reducing short term migration. To test for endogenous regressors, we include the residuals obtained from tobit regressions along with the actual number of days in the second stage probit regression. The coefficient of the residuals provides the test for exogeneity (Ravallion and Wodon, 2000).

V. Results

¹² Bivariate probit for impact evaluation has been used by Evans and Schwab (1995), Walters (1999), Chen et al. (2005) and Hutchinson and Wheeler (2006)

Descriptive Statistics

Table 2 lists the variables used in the regressions as well as the descriptive statistics of samples households and then segregated by households (i) who did not migrate for short-term and (ii) engaged in short-term migration. Out of 556 households in the sample, at least 1 member from 82 households migrated for short-term that consist of one to six months. This means more than 14.7% of households engage in short term migration. Also, it has been found that while the average number of days worked by a household in the sample is about 20 days, for migrating households, the average days is only 12.3 and for non-migrating households, it is about 21 days. This implies that there is a substantial difference between the mean days between the two types of households and that households may have opt not to migrate given higher number of days of work.

[Table 2 about here]

Coming to primary variables of interest, it is found that about 49.6% of the households got work under MGNREGS in 2010. Taking the households, which did not send any of members to migrate, the participation rate in MGNREGS is 51.3% whereas the participation rate for households, which migrated, is 40.2%. This show there might be some evidence of reducing impact of the programme in reducing migration.

Moving to the basic statistics for the controls, it is found that the caste distribution among households, from which at least one member migrated is slightly biased towards the upper castes, when compared to their demographic composition. This may be because upper castes are able to form migration networks, which makes migration conducive and less costly. Coming to religion distributions, it is found that proportion of Muslims among the migrating households is higher than their demographic proportion. It is also found that the main occupation of the short-term migrating household is agricultural labour, which is expected since these are the households which have to cope up with the lack of employment opportunities during agricultural lean season, due to which some of the members of the household have to migrate. Interestingly, average land cultivated for the households, which is engaged in migration, is significantly higher (at 5% level of significance) than that for the households, which do not send some of its members to migrate or short term. This may be because migration involves a cost, which can be

borne only by households, with some amount of land. Landless households do not have the financial capacity to bear the initial costs of migrating to some place. In fact an individual of age 26 years in the Dakhin Bara Haldibari panchayat of the Haldibari block working as an agricultural labour reported that he wants to migrate to Kerala for casual labour works but is unable to do so because of the cost that has to be incurred initially.

Expectedly, among households whose member migrated, the proportion of their heads educated to the secondary or higher level is lower than the demographic proportion. Educated household do not migrate for short term but mostly they migrate for long term with regular wage jobs. Female heads among the migrating household is lesser than the proportion of female heads in the sample and this is quite expected since female headed household are labour constrained, they do not tend to migrate. As expected, in households, which have sent at least one member to migrate, the ratio of kids to the household size is lower than the non-migrating households. Also it is found that migrating households have higher ratio of the number of working age male members to household size than the non-migrating households.

Regression Results

Before proceeding to the main regressions, a preliminary regression is run with the outcome variable of whether the household sought work under MGNREGS, which is a binary variable. The main independent variable of interest is whether any member of the household migrated for short-term or not in the year 2010, which is again a binary variable. All the other controls, as discussed above are used in the regression. It is found that the coefficient of the variable, whether any member of the household migrated or not is insignificant though the value is positive indicating that households which migrated in 2010 had higher chances of seeking work under the programme in 2011 after controlling for all the other observable factors, though the effect was not substantial¹³. This implies that there may be some impact of the programme in reducing migration too, which will be explored in the subsequent regressions.

Impact of participation in MGNREGS:

¹³ The regression tables can be produced on request.

As discussed, to take care of the potential endogeneity problem, we make use of two regression methodologies- Bivariate Probit and Probit model with endogenous regressors taking the variable, participation in MGNREGS as linear. Table 3 shows the regression results from both these models.

[Table 3 about here]

As required in bivariate probit model, at least one identifying variable that is present in the first equation should not be present in the second equation. The idea is to have a variable, (Z in equation 2) that is theoretically and conceptually related to participation in MGNREGS but not related to migration decision. The proposed identifying variables are (i) a dummy of whether the household head attends political meetings and rallies and (ii) ratio of the MGNREG wage to the wage received by the main earner of the household. Both these variables are likely to have an impact on participation under the programme but are most unlikely to affect migration status directly. Ethnographic evidences from the field suggest that participation of household head in political meetings and rallies determine majorly if the household would get work under the programme. Many households have been found not to get work despite seeking for it since they are daily wage earners and the head cannot attend in the political campaigns. So participation in political meetings and rallies should affect participation in MGNREGS. However the variable is unlikely to have an impact on migration decision. Similarly the wage ratio is likely to affect participation in MGNREGS; when the ratio would increase the participation would be higher and vice versa. However, there is very less connection between this variable and migration. Simple probit regression of whether any member of the household migrated or not run on these two identifying variables separately along with the other controls show insignificant coefficients indicating that the variables are not instrumental in determining migration decision of a household.

Columns (1) and (2) show the two probit regression results of households, getting work and then migrating separately. Results from column (1) show expected findings. Lower caste groups (SC/ST and OBC) have higher probability of getting work under MGNREGS compared to Upper Castes. Households, engaged primarily with occupations like agriculture and agricultural labour have significantly higher probability of getting work under the programme. Households with BPL cards have significantly higher chances of getting work and this is at 5%

level of significance. Further, households staying in non-cemented and semi-cemented houses have significantly higher chances of participating under MGNREGS. Importantly, the identifying variables- (i) Participation of household head in political meetings and rallies and (ii) ratio of MGNREGS wage to wage of the main earner of the household both are found to be significant at 1% level of significance.

Coming to column (2), which presents the probit regression results of whether the household engaged in migration. Interestingly, the coefficient on whether the household got work under MGNREGS in 2010 though is negative remains insignificant. This implies that the participation under the programme had no impact in reducing migration. Field observations say that this is possible since most of the households received work for 12 to 15 days. In fact, average number of days of work in Devanganj GP and Dakhin Bara Haldibari GP is 14 days and 11.5 days respectively. With only 14 and 12 days of work for the whole year, it is very likely that the household migrating decision would not be affected because of participation in MGNREGS. Several households reported that they would not have migrated had they received more number of days of work. The coefficients on controls mostly show insignificant results, however households with the main occupation as non-agricultural labour and self-employed have higher chance of sending at least one member to migrate for short term. Further, it is found that the coefficients of the ratio of working age male members to household size is positive and significantly affects households decision to migrate for short term. However, the most important thing is ρ which determines the covariance of the error terms of the two equations comes out to be insignificant, which suggest that the null of exogeneity assumption is not violated. Wald test also confirms that there is no endogeneity. This entails that simple probit regression would be sufficient enough to gauge the impact of the programme in reducing short term migration.

Probit regression with endogenous regressors treating participation in MGNREGS as a linear is also performed along with the controls. Table 3 presents the regression results from the first equation as well as the second. We use the same sets of variables as instruments that were used while running the bivariate probit regression. We perform Cragg-Donald weak identification test of the instruments and it is found that the instruments are strong. The results are similar to the bivariate probit regressions. Participation in MGNREGS remains negative but insignificant indicating no strong impact of the programme in reducing migration. The results on

controls are again similar to that presented in column (1) and (2). However, as in the case of bivariate probit regression, Wald test of exogeneity show a p value of 0.69 implying we cannot reject the null of exogeneity. This signifies again that a simple probit regression would be enough to assess the impact of MGNREGS on household migration decision for short term.

Results from probit regression are presented in column (5) and shows no change as expected. It is found that participation in MGNREGS has no significant impact on migration decision of the household though the coefficient comes out to be negative. The coefficients on the controls remain similar to the other two models. Households, whose major occupation is non-agricultural labour and self-employment, are found to have significantly higher probability of sending at least one of its members to migrate for short term when compared to those of regular wage. As predicted by the bivariate probit model and the probit model with endogenous regressors, ratio of male working age members to the household size is significant (at 1% level of significance) and positively affects the decision of households to migrate.

Impact of number of days of participation and annual earnings from MGNREGS

The results from above regressions show that household participation in MGNREGS has insignificant impact on reducing household short term migration. This is largely because of the less number of days of work that the household got, which is insufficient to affect migration status of the household. However, in the Dawaguri GP of the Cooch Behar-I block where implementation of the programme has been good compared to the other three GPs, anecdotal evidences suggest that migration is low in this area. Interviews with many households reveal that before the inception of MGNREGS, they had to migrate in cities like Jaipur, Mumbai, Delhi and Kolkata for casual labour works. Over the last few years, however they do not have to migrate since they are able to get work under the programme during the lean and festival season (especially from October to March). They also reported that had MGNREGS was not in place at present they would have to migrate at least for three to six months to earn a living. This indicates that number of days of work may have an impact in reducing short term migration. With similar reasons, the annual earnings from the programme also might have substantial impact in reducing migration. Hence we proceed to find if indeed this is true. Since number of days of work and earnings is a censored variable, we run a tobit regression on the number of days of work and then use the estimates to run probit regressions which determines if extent of participation and

earnings has any impact in reducing short term migration. The results from the regression are presented in table 4 and table 5.

[Table 4 about here]

[Table 5 about here]

The tobit estimates on the number of days of work in MGNREGS by households are shown in column (1) of table 4. Since number of days is count variable, the dependent variable as log (Number of days of work+1). This ensures that when the household did not work, the dependent variable remains 0. Results from the regression suggest that lower caste groups are associated with higher number of days of work compared to the upper caste households. Poorer households with BPL cards and whose main occupation is agricultural labour work for significantly higher number of days on average. Households, whose houses are semi-cemented or non-cemented, have significant chances of working for higher number of days (at 1% and 5% level of significance respectively). Importantly, the two identifying variables- ratio of MGNREGS wage to the wage of the main earner of the household and participation of household head in political rallies and campaigns, both comes out to be significant at 1% level of significance. Both affect number of days of work under the programme positively.

To find the impact on migration decision of the household, we use the number of days of work as an explanatory variable in the probit regression to determine migration decision of the household along with the residuals obtained from the tobit model above. The results are presented in column (2) of table 4. In line with the anecdotal evidence already discussed, we find number of days has a significant impact on migration decision. The probability of household sending at least one member for short term migration decreases as the number of days of participation in MGNREGS increases.

The coefficients on controls show similar results to that obtained in the migration regressions of table 3. Households, whose main occupations are non-agricultural labour and self-employment have significant and positive chances of engaging in migration for short term. Also, we find that when number of working age male members of the household increases in proportion to the household size, the probability of short term migration increases significantly.

If extent of participation in MGNREGS is endogenous to migration decision of the household, the residuals should be significant. However, the coefficient of the residual in column (2) of table 4 comes out to be insignificant indicating that there is no endogeneity problem and simple probit regression would fetch the impact of the number of days of participation on migration status of the household. Estimates from the probit regression without residuals are shown in column (3). We find similar results to the ones that is presented in column (2). We again find that the extent of participation measured through number of days of work has a significant and reducing impact on probability of the household to send at least one of its members for short term migration. Results on other controls are similar to other probit regressions on migration decision of the household.

Results obtained from table 5 also show similar trend. It is found that annual earnings from MGNREGS have significant impact in reducing short-term migration. As the household work and get more income from the programme, it is found that the probability of migration decreases significantly (at 10% level of significance). Other variables show similar trends to those found from the estimations presented in table 4.

To strengthen the findings that higher number of days of work and higher earnings from MGNREGS results in reduction of migration, we use local polynomial smoothing regressions and estimate the probability density function of a household sending at least one member for short term migration vis-à-vis the log of number of days of work and annual earnings¹⁴. The probabilities are plotted and presented in Figure 1 and 2. It is found that the probability of a household to send at least one member for migration has a decreasing trend against increasing number of days of work and annual earnings in 2010 from the programme. This validates the estimation results obtained from the regressions, presented in table 4 and table 5.

[Figure 1 about here]

[Figure 2 about here]

VI. Discussion and Conclusion

¹³For more on the methodology, please refer Fan and Gijbels (1996).

With the advent of liberalization policy and economic growth, migration has been increasing in India. While it was around 25% in 1993, at present it amounts to more than 30% of the total population. Though there are several reasons, migration for employment opportunities remains to be the burgeoning factor in which short term migration remains as one of the most important type. Studies have indicated that lack of employment opportunities and the failure of agriculture in rural areas is the reason why short term migration is increasing. Also associated is the financial, social and emotional vulnerability of the migrants and increase in over crowdedness of urban areas. MGNREGS was passed in the year, 2005 with a primary objective of reducing short term migration by generating employment in the rural areas especially during the lean season. This paper attempts to explore the impact of the programme in reducing short term migration taking primary data collected from the Cooch Behar district of West Bengal. Though there are been studies based on ethnographic evidences, to our knowledge, this is the first work to evaluate the impact of the programme in reducing short term migration both quantitatively and qualitatively.

Using probit estimates, we find that participation of a household in MGNREGS in the year 2010 has no significant impact in reducing short term migration by any of its members of the household. There are concerns about exogeneity assumption of participation of households in MGNREGS and their migration decision. However applying bivariate probit model and probit model with endogenous regressors, we find that the variable can be treated as exogenous.

Coming to the impact of extent of participation of households indicated by the number of days of work, it is found that this has a reducing impact on migration decision of the household. Using OLS regression, it is found that as the number of days of getting work under MGNREGS by a household increases, the probability of any of its members to migrate for short term decreases significantly. Concerns of exogeneity was taken care of by making use of two stage regression strategy where the number of days of work is estimated through tobit model and then using the residuals in the probit regression of the migration decision by the household. It is found that the coefficient of the residuals is insignificant indicating that number of days of work is even exogenous to migration decision of the household. So we proceed by simple OLS regression, which shows significant reducing impact of the programme on short term migration by households.

There have been wide reports that MGNREGS has been effective in massive reduction of rural out-migration. In fact a paper by Banerjee and Saha (2010) concluded about decreasing trends of out migration with the commencement of MGNREGA works after a survey in some of the villages of three states, Orissa, Jharkhand and Chattisgarh. This has been possible through employment opportunities created especially during the lean season and also due to overall increase in rural agricultural and non-agricultural wages. As an example, as reported by most of the interviewers, the agricultural wage rate prevailing in the Dawaguri GP of the Cooch Behar-I block was higher than the wage rates in the other three GPs particularly Also, assets created by the programme can help in increasing agricultural yield and productivity which can lead to reduction in migration. For instance, a work under undertaken in the Dawaguri GP involved building a flood proof structure across the shores of the Torsa river in 2011 helped in developing the adjacent area into farm land. Households reported that earlier the area used to be flooded because of the river and hence agriculture could not be practiced in the land. However, after the structure was built under the programme, this land regained its fertility and now it has started to produce corn and tobacco. Incidentally, this household used to migrate 5 years back but at present due to the work received under MGNREGS along with the farming opportunity, the head has stopped migrating.

These pieces of anecdotal evidence and quantitative outcomes shown in the paper imply that MGNREGS has the potential to reduce migration. However, implementation of the programme varies across region. While the two GP in the Haldibari block- the Devanganj Gp and the Dakhin bara Haldibari GP show poor implementation, the Dawaguri GP shows better implementation of the programme, which has its impact in reducing short term migration. Hence it is important for the policy makers and administrators to improve planning, vigilance and coverage of this welfare programme. Only then can the people to enjoy its fruits, which would lead to reduced migration and better human development outcomes.

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Table 1: Average person days generated for all the districts in West Bengal from 2009-10 to 2012-13

Districts	2009-10	2010-11	2011-12	2012-13
24 Paragans (South)	17.16	20.32	32.12	40.55
Bankura	22.63	37.65	30.57	34.68
Birbhum	22.38	26.38	36.09	40.99
Dinajpur Dakshin	19.18	20.33	21.38	23.74
Dinajpur Uttar	11.56	17.04	18.40	17.82
Jalpaiguri	25.45	23.20	25.99	23.71
Maldah	18.67	22.34	28.94	28.16
Medinipur West	26.77	29.87	24.76	26.29
Murshidabad	18.85	24.80	21.93	24.83
Purulia	26.75	33.47	28.69	33.49
24 Parganas (North)	28.31	32.22	34.60	43.90
Burdwan	23.28	32.79	25.43	28.59
Coochbehar	13.74	13.98	14.10	16.17
Hooghly	17.18	28.68	30.73	36.19
Nadia	19.33	19.16	19.08	39.08
Purba Medinipur	23.35	23.63	26.72	34.25
Siliguri Mahakuma Parisad	12.64	17.20	18.32	18.19
Darjeeling Gorkha Hill Council	20.85	37.52	50.15	59.25

Source: <http://nrega.nic.in/netnrega/home.aspx>

Table 2: Descriptive statistics and variables used in the regressions

	Total Sample	Did not migrate	Migrated
<i>Variables of Interest</i>			
Proportion of households who worked in 2010	0.496	0.513	0.402
No. of days of work	19.804	20.819	12.333
<i>Controls</i>			
<i>Caste</i>			
Upper Caste	0.302	0.297	0.329
SC/ST	0.550	0.551	0.549
OBC	0.147	0.152	0.122
<i>Religion</i>			
Hindu	0.782	0.789	0.744
Muslim	0.218	0.211	0.256
<i>Main Occupation</i>			
Regular Wage	0.059	0.068	0.012
Agriculture	0.228	0.230	0.220
Agricultural Labour	0.245	0.266	0.122
Non-agricultural Labour	0.288	0.251	0.500
Self Employed	0.106	0.103	0.122
Others	0.074	0.082	0.024
BPL Card	0.662	0.671	0.610
<i>Household Type</i>			
Fully cemented	0.191	0.192	0.183
Semi cemented	0.239	0.232	0.280
Not cemented	0.570	0.576	0.537
Livestocks	1.446	1.407	1.671
Land cultivated	1.831	1.719	2.476
<i>Head Details</i>			
Age	46.811	46.673	47.610
<i>Education of the head</i>			
Secondary and Above	0.149	0.156	0.110
Illiterate	0.218	0.230	0.146
Below Primary, Primary and Middle	0.633	0.614	0.744
Female head	0.09	0.097	0.049
Ratio of non-school kids to household size	0.063	0.066	0.045
Ratio of working age male members to household size	0.372	0.356	0.462
<i>Instruments</i>			
Ratio of MGNREGS wage to the wage received by the main earner	0.778	0.784	0.743
Attends political meetings and rallies	0.612	0.616	0.585
N	556	474	82

Table 3: Estimation from Bivariate Probit, Probit regression with endogenous regressors and Simple probit regression

	Bivariate Probit		IV-Probit		Simple Probit
	Work	Migration	Work	Migration	Migration
	(MGNREGS)		(MGNREGS)		
	(1)	(2)	(3)	(4)	(5)
Main Variable					
Worked in 2010		-0.248 (0.639)		-0.482 (0.632)	-0.246 (0.151)
Controls					
<i>Caste (Ref. Upper Caste)</i>					
SC/ST	0.356* (0.197)	-0.016 (0.206)	0.103 (0.063)	0.007 (0.205)	-0.016 (0.187)
OBC	0.572* (0.299)	-0.008 (0.238)	0.167* (0.095)	0.034 (0.233)	-0.008 (0.212)
<i>Religion (Ref. Hindu)</i>					
Muslim	0.287 (0.248)	0.084 (0.242)	0.080 (0.079)	0.096 (0.239)	0.084 (0.227)
<i>Main occupation (Ref. Regular wage)</i>					
Agriculture	0.653* (0.338)	0.697 (0.468)	0.189** (0.088)	0.742 (0.464)	0.697 (0.435)
Agricultural labour	0.654** (0.306)	0.729 (0.592)	0.197** (0.089)	0.782 (0.580)	0.729 (0.550)
Non-agricultural labour	0.246 (0.324)	1.523*** (0.484)	0.057 (0.091)	1.537*** (0.471)	1.523*** (0.477)
Self employed	0.589* (0.329)	1.251*** (0.422)	0.152 (0.101)	1.287*** (0.416)	1.250*** (0.407)
Others	-0.718* (0.329)	0.232 (0.422)	-0.208** (0.101)	0.196 (0.416)	0.232 (0.407)

	(0.367)	(0.582)	(0.104)	(0.577)	(0.583)
BPL Card	0.306**	-0.069	0.103***	-0.040	-0.069
	(0.123)	(0.161)	(0.040)	(0.162)	(0.155)
<i>Housing (Ref. fully cemented)</i>					
Semi-cemented	0.582***	0.209	0.193***	0.257	0.208
	(0.171)	(0.249)	(0.056)	(0.240)	(0.233)
Non-cemented	0.347**	0.303	0.119**	0.336	0.302
	(0.173)	(0.221)	(0.058)	(0.212)	(0.222)
Livestocks	-0.064	0.044	-0.020	0.038	0.044
	(0.043)	(0.065)	(0.014)	(0.063)	(0.064)
Land cultivated	0.015	0.053	-0.002	0.052	0.053
	(0.059)	(0.062)	(0.020)	(0.061)	(0.062)
Square of Land cultivated	0.002	0.000	0.001	0.000	0.000
	(0.003)	(0.003)	(0.001)	(0.003)	(0.003)
Age of the head	0.083*	-0.052	0.025*	-0.046	-0.052
	(0.046)	(0.051)	(0.015)	(0.050)	(0.044)
Square of age of the head	-0.001*	0.001	0.000	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<i>Education of the head (Ref. secondary and above)</i>					
Illiterate	0.227	0.034	0.0630	0.060	0.034
	(0.206)	(0.310)	(0.067)	(0.305)	(0.270)
Primary and Middle	0.263	0.175	0.073	0.200	0.175
	(0.176)	(0.262)	(0.057)	(0.262)	(0.245)
Female head	-0.231	-0.428	-0.054	-0.438	-0.428
	(0.228)	(0.362)	(0.073)	(0.356)	(0.345)
Ratio of non-school kids to household size	0.676	-0.396	0.186	-0.353	-0.396
	(0.621)	(0.621)	(0.201)	(0.621)	(0.607)

Ratio of working age male members to household size	0.104 (0.265)	1.610*** (0.417)	0.014 (0.088)	1.607*** (0.424)	1.610*** (0.421)
Ratio of MGNREGS wage to the wage received by the main earner	1.895*** (0.499)		0.492*** (0.123)		
Attends political meetings and rallies	0.532*** (0.102)		0.172*** (0.033)		
ρ		0.014 (0.379)		0.113 (0.28)	
Fixed Effects at GP level	Yes	Yes	Yes	Yes	Yes
N	556	556	556	556	556

Note: The numbers in the parenthesis is the robust standard error. The standard error has been clustered at the village level. *** represents significance at 1% level of significance. ** represents significance at 5% level of significance, * represents significance at 10% level of significance

Table 4: Estimations from tobit regressions and probit regressions with and without residuals to find the impact of number of days of work in reducing short-term migration

	Number of days of work		Decision of migration	
	Tobit (1)	With residuals (2)	Without residuals (3)	
Main Variable				
Residuals		0.032 (0.108)		
Number of days of work		-0.118** (0.050)	-0.123** (0.051)	
Controls				
<i>Caste (Ref. Upper Caste)</i>				
SC/ST	0.760* (0.397)	0.018 (0.219)	-0.004 (0.186)	
OBC	0.996* (0.589)	0.039 (0.246)	0.008 (0.212)	
<i>Religion (Ref. Hindu)</i>				
Muslim	0.650 (0.538)	0.115 (0.251)	0.099 (0.226)	
<i>Main occupation (Ref. Regular wage)</i>				
Agriculture	1.396 (0.752)	0.759 (0.487)	0.714 (0.435)	
Agricultural labour	1.501** (0.690)	0.810 (0.619)	0.758 (0.549)	
Non-agricultural labour	0.732 (0.714)	1.570*** (0.506)	1.542*** (0.477)	
Self employed	1.153 (0.718)	1.310*** (0.444)	1.270*** (0.406)	
Others	-0.831 (0.860)	0.218 (0.584)	0.232 (0.585)	

BPL Card	0.522**	-0.045	-0.063
	(0.245)	(0.163)	(0.154)
<i>Housing (Ref. fully cemented)</i>			
Semi-cemented	1.211***	0.275	0.238
	(0.307)	(0.237)	(0.234)
Non-cemented	0.879**	0.358*	0.328
	(0.356)	(0.213)	(0.223)
Livestocks	-0.106	0.042	0.046
	(0.079)	(0.062)	(0.063)
Land cultivated	0.007	0.054	0.054
	(0.108)	(0.062)	(0.062)
Square of Land cultivated	0.003	0.000	0.000
	(0.005)	(0.003)	(0.003)
Age of the head	0.146*	-0.045	-0.050
	(0.083)	(0.048)	(0.044)
Square of age of the head	-0.001	0.000	0.000
	(0.001)	(0.000)	(0.000)
<i>Education of the head (Ref. secondary and above)</i>			
Illiterate	0.598	0.066	0.041
	(0.414)	(0.323)	(0.272)
Primary and Middle	0.605	0.203	0.178
	(0.370)	(0.276)	(0.247)
Female head	-0.453	-0.440	-0.425
	(0.434)	(0.364)	(0.347)
Ratio of non-school kids to household size	1.057	-0.352	-0.382
	(1.077)	(0.626)	(0.599)
Ratio of working age male members to household size	0.165	1.649***	1.641***
	(0.507)	(0.418)	(0.419)

Ratio of MGNREGS wage to the wage received by the main earner	2.483*** (0.544)		
Attends political meetings and rallies	1.012*** (0.203)		
Fixed Effects at GP level	Yes	Yes	Yes
N	556	556	556

Note: The numbers in the parenthesis is the robust standard error. The standard error has been clustered at the village level. *** represents significance at 1% level of significance. ** represents significance at 5% level of significance, * represents significance at 10% level of significance

Table 4: Estimations from tobit regressions and probit regressions with and without residuals to find the impact of annual earnings from MGNREGS in reducing short-term migration

	Annual earnings	Decision of migration	
	Tobit (1)	With residuals (2)	Without residuals (3)
Main Variable			
Residuals		0.012 (0.040)	
Annual earnings		-0.037* (0.020)	-0.039* (0.021)
Controls			
<i>Caste (Ref. Upper Caste)</i>			
SC/ST	1.718* (0.967)	0.006 (0.211)	-0.013 (0.186)
OBC	2.410* (1.399)	0.028 (0.244)	-0.001 (0.212)
<i>Religion (Ref. Hindu)</i>			
Muslim	1.331 (1.229)	0.099 (0.242)	0.088 (0.226)
<i>Main occupation (Ref. Regular wage)</i>			
Agriculture	3.747* (1.916)	0.750 (0.484)	0.704 (0.435)
Agricultural labour	3.773** (1.735)	0.791 (0.613)	0.740 (0.549)
Non-agricultural labour	1.889 (1.817)	1.560*** (0.504)	1.531*** (0.476)
Self employed	3.149* (1.845)	1.299*** (0.442)	1.258*** (0.406)
Others	-2.461	0.216	0.233

	(2.162)	(0.584)	(0.583)
BPL Card	1.425**	-0.048	-0.066
	(0.627)	(0.162)	(0.155)
<i>Housing (Ref. fully cemented)</i>			
Semi-cemented	3.000***	0.256	0.220
	(0.807)	(0.234)	(0.233)
Non-cemented	2.039**	0.341	0.314
	(0.897)	(0.212)	(0.222)
Livestocks	-0.280	0.041	0.044
	(0.206)	(0.063)	(0.063)
Land cultivated	-0.003	0.054	0.054
	(0.289)	(0.062)	(0.062)
Square of Land cultivated	0.009	0.000	0.000
	(0.012)	(0.003)	(0.003)
Age of the head	0.367*	-0.047	-0.051
	(0.219)	(0.047)	(0.044)
Square of age of the head	-0.004	0.000	0.000
	(0.002)	(0.000)	(0.000)
<i>Education of the head (Ref. secondary and above)</i>			
Illiterate	1.391	0.062	0.038
	(1.033)	(0.316)	(0.271)
Primary and Middle	1.518	0.201	0.177
	(0.925)	(0.272)	(0.246)
Female head	-1.077	-0.439	-0.427
	(1.095)	(0.359)	(0.346)
Ratio of non-school kids to household size	2.846	-0.359	-0.389
	(2.801)	(0.626)	(0.603)
Ratio of working age male members to household size	0.088	1.623***	1.619***

	(1.284)	(0.419)	(0.420)
Ratio of MGNREGS wage to the wage received by the main earner	7.057***		
	(1.497)		
Attends political meetings and rallies	2.513***		
	(0.527)		
Fixed Effects at GP level	Yes	Yes	Yes
N	556	556	556

Note: The numbers in the parenthesis is the robust standard error. The standard error has been clustered at the village level. *** represents significance at 1% level of significance. ** represents significance at 5% level of significance, * represents significance at 10% level of significance

Figure 1: Local polynomial smoothing curve of the probability of at least one member of the household migrating against the number of days of work it got in 2010

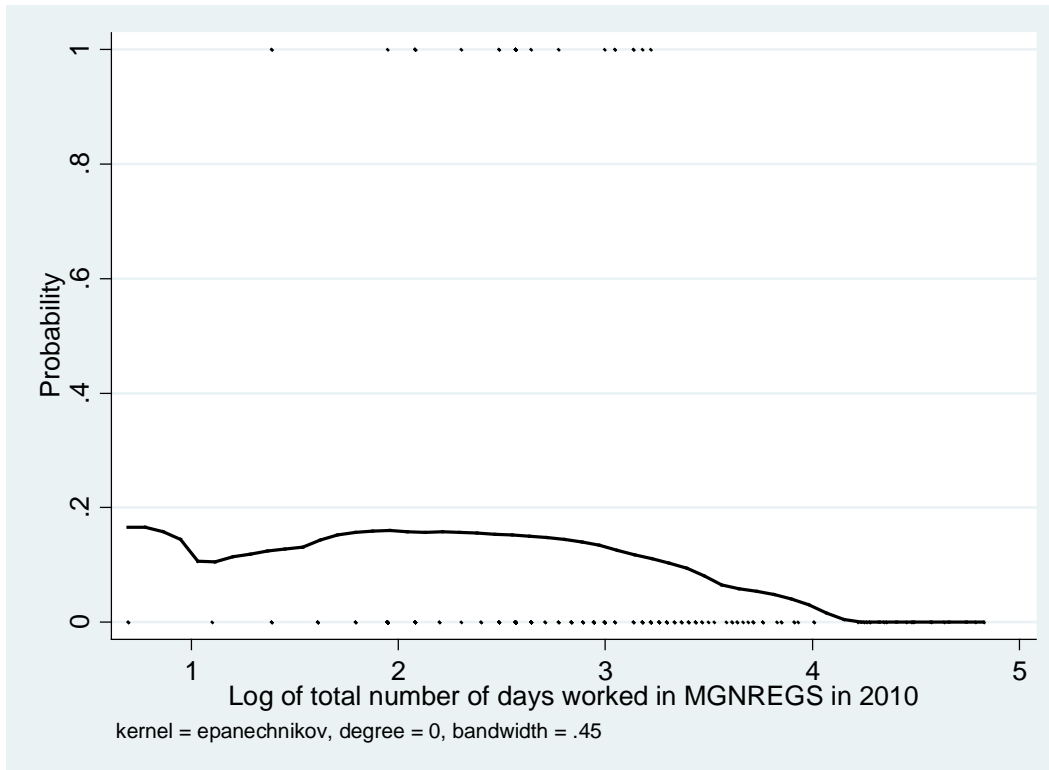


Figure 2: Local polynomial smoothing curve of the probability of at least one member of the household migrating against the annual earnings (total wages) of the household from MGNREGS in 2010

