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DISCUSSION PAPER SERIES

IZA DP No. 10902

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ABSTRACT

Skills Training and Employment Outcomes in Rural Bihar

In a number of countries, youth unemployment is a pressing economic and political concern. In India, 54 percent of the country's population of 1.21 billion is below the age of 25 and faces a high rate of (disguised) unemployment. To augment youth employment, the Government of India has launched a number of skills training programs. This paper deals with participation in and the impact of one of these programs (DDUJKY) located in rural Bihar, one of India's poorest states. The analysis is based on data collected in mid-2016 and compares training participants with non-participants who applied for the scheme but eventually did not attend. We find that the training program squarely reaches the intended target group - rural poor youth. Initially, the program leads to a 29 percentage point increase in the employment rate of the trained graduates. However, two to six months after the training, the employment effect of the program drops to zero. A third of the placed graduates leave their jobs due to caste-based discrimination and another third leave due to a mismatch between the salaries offered and their living costs. The upshot is that while the training program enhances job market prospects, other labor market factors undo the positive effects.

JEL Classification: J60, J68
Keywords: India, Bihar, skills training, youth unemployment

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1. Introduction

According to the 2013 World Development Report (WDR), worldwide, some 200 million people, including a disproportionate share of about 75 million who are below the age of 25 are unemployed and actively looking for work. The report goes on to argue that over 600 million jobs will be needed in the next 15 years to absorb the increase in the working-age population, mainly in Asia and Sub-Saharan Africa.

The issue is not only one of unemployment, but is exacerbated by the large proportion of individuals working in the informal economy. Indeed, half of all workers in developing countries are engaged in small-scale agriculture or self-employment, jobs that don't provide steady pay-checks and benefits. One of the challenges in addressing youth unemployment is the low level of formal schooling compounded by the skills gap – that is, the gap between the skills needed by employers and the existing skill set of job seekers.

India is an example of a developing country facing a pressing need to devise strategies to provide regular employment to its youthful population.[1] India is amongst the youngest nations in the world and the expected 'bulge' in the 15-59 age group over the next decade offers an opportunity but also a challenge. The opportunity stems from the expected global shortage of 56 million young people (15-35 years) and India could potentially serve as a worldwide sourcing hub for skilled manpower (Ministry of Labour and Employment, 2014). On the other hand, a failure to provide opportunities to the youth population as they enter the labour market may translate into a 'demographic disaster' rather than a dividend (Mitra and Verick, 2013).

The twin challenges of creating jobs while at the same time bridging the skills gap are well recognized by the Indian Government. Consistent with this policy priority, on September 25th, 2014, the Government launched the 'Deen Dayal Upadhyaya Grameen Kaushal Yojana'

[1] With a population of 1.21 billion of which more than 62 percent are in the working age group of 15-59 years and more than 54 percent are below 25 years, India is amongst the youngest nations in the world (Ministry of Skill Development and Entrepreneurship, 2015).

(DDUGKY), a program for training, skill building and job placement intended for rural youth from poor families. The vision of the program is to:

> *'Transform rural poor youth into an economically independent and globally relevant workforce'* (Ministry of Rural Development, 2016).

The scheme implements skill development through a Public-Private Partnership mode (PPP model), whereby registered private sector partners or project implementation agencies (PIA) plan and implement skills training and place program participants. The DDUGKY is not an entitlement program but rather, eligible candidates decide whether to participate or not, in government sponsored training programs. Candidates in the age group 15-35 are eligible to participate if they belong to the below-poverty-line (BPL) category or if any member from their family is a member of a self-help group (SHG).[2] If neither of these conditions are met then an applicant needs to provide a letter of recommendation from the Gram Panchayat (Ministry of Rural Development, 2016).[3]

The intention of the DDUGKY and other similar programs is to attenuate unemployment and poverty but this is possible only if social structures do not hinder voluntary participation in the program. If there are differences in program access based on caste, gender or other social markers, either in program participation or in job placement after training, then increasing government spending and augmenting the supply of trained individuals may achieve little towards the final goal of enhancing welfare and equity. Hence, from a policy perspective, it is important to examine both, the factors promoting or hindering scheme participation and to identify the impact of the scheme on employment prospects and earnings.

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[2] BPL is used by the Indian government to identify individuals and household in need of government assistance. Internationally, an income of less than $1.90 per day per head in purchasing power parity terms is defined as extreme poverty. In India, the number of people living on or less than $1.90 per day based on the 2011 census was 259.5 million (21.3 percent of the population). In India, BPL scoring is done on the basis of 13 parameters ranging from 0-4. Families that score 17 or less out of 52 are classified as BPL.

[3] A Gram Panchayat is a village level administrative body whose main task is to implement development programs. It is part of a three tier Panchayati Raj Institution (village, block and district level) created by the 73rd amendment of the constitution. There are about 250,000 gram panchayats in India.

Despite the large number of skills training and employment programs operating in India, and the considerable resources expended on such schemes, systematic evaluations of their impact on creating employment as well as assessing whether such schemes reach the intended population, are limited. This paper offers such an analysis. Based on both, survey and qualitative data, collected in a district in North Bihar, this paper examines the role of socio-economic and demographic characteristics in determining scheme participation. Subsequently, we evaluate the effect of scheme participation on employment and earnings.

Although the study focuses on one course offered through a government sponsored program, that is, the DDUGKY, it has much wider applicability as similar programs are being implemented in various parts of the country. For instance, another important skill building program is the "Pradhan Mantri Kaushal Vikas Yojana" (PMKVY) which is almost similar to DDUGKY and is also being implemented by the central government. In addition, various state specific programs such as 'Himayat' (for rural youth in Jammu & Kashmir), 'Roshni' (rural youth in 27 left-wing extremist districts across 9 states), and 'Star' (Standard training assessment and reward scheme) are also being implemented.

The rest of the paper unfolds by providing in Section 2 a review of the existing literature on youth training programs with a focus on schemes operating in developing countries. Section 3 provides an overview of the DDUGKY. Section 4 discusses the sampling strategy and data collection while section 5 outlines an analytical framework, presents results and explores the financial returns from the program. Section 6 contains concluding remarks.

2. Skills training programs in developing countries – a brief review

There is a large and active body of research using a variety of methodological approaches on the effect of skills training programs on employment outcomes and earnings in OECD countries. For instance, Björklund (1994) and Forslund and Krueger (1997) provide early reviews of the evidence based on Sweden's experience with such programs while Heckman et al. (1999) review

the US literature.[4] Based on the US experience, Heckman et al. (1999) conclude that job training programs have modest positive effects on adult earnings and no impact on the youth. These early reviews have been followed by multi-country reviews of experiences in other OECD countries. For instance, De Koning (2005) reviews 130 studies while Kluve (2010) assesses the effects of active labor market programs including skills-training programs based on 73 microeconomic evaluations carried out in Europe. De Koning (2005) concludes that training interventions have no effect on unemployed young workers while Kluve (2010) writes that "traditional training programs are found to have a modest likelihood of recording a positive impact on post-program employment rates" but that programs targeted at the youth are less successful. Meager (2009) assesses the various review articles and concludes that, at best, the impact of vocational training programs is small, and that only small-scale programs targeted at groups experiencing a skill-shortage coupled with active employer engagement and on-the-job training are likely to be effective at enhancing employment prospects. Meager (2009) also argues that is not "generally the case" that larger impacts are observed over a longer post-intervention period while at the same time pointing out that the lack of skill-training effects maybe due to slack labor demand, especially in developed countries where skill-levels are already high.

The body of work on developing countries is considerably smaller but is growing. Betcherman, Dar and Olivas (2004) review the effects of 5 youth training and employment generation programs in Latin America. In contrast to the zero effects of such programs in developed countries, all the Latin American interventions report a positive effect on the probability of employment.[5] The sharp difference in findings across different contexts is perhaps not unexpected as trainees in developing countries have lower levels of formal education and

[4] Active labor market programs were initially developed in Scandinavia and thereafter spread to other OECD countries (Meager, 2009).

[5] The youth training employment programs (*Joven*) in Latin America were initiated in Chile in 1991 and thereafter similar programs have been implemented in Argentina, Colombia, Peru, and Uruguay. The various programs target youth from low-income families, with low educational attainment, and with limited or no job experience. The programs consist of basic literacy, training in a trade which is in demand, work experience, and help finding a job. Typically, the intervention lasts for six months and includes 200 to 400 hours of training and two to three months of work experience.

skills and it is quite likely that their employability is hampered by a shortage of skills. While the experiences based on these schemes is encouraging, the picture emerging from several recent randomized evaluations of training programs targeted at disadvantaged youth does not yield such a sanguine picture. Card et al. (2011) and Ibarrarán et al. (2014) analyse the impact of a vocational training program in the Dominican Republic, Cho et al. (2013) analyse the effect of an intervention in Malawi. In both countries, reminiscent of the developed country literature, the interventions have no effect on employment. Attanasio et al. (2011) find mixed evidence in the case of Colombia, where training leads to a 7 percentage point increase in employment and a 20% increase in earnings, but only for young women. In contrast to the women-only effect in Colombia, Alzúa et al. (2016) find large effects for men in the case of a youth training program in Cordoba, Argentina. Their randomized evaluation based on a sample size of 407 individuals (220 treatment and 187 control) participants who were followed for a long period shows that in the short-term (18 months after the program), program participation increases the probability of employment by 8 percentage points and earnings by about 40%. However, these effects do not last and dissipate in the medium (33 months) and long term (48 months).[6]

In the Indian context, we were unable to find studies that have estimated the impact of youth skills training programs sponsored by the government. Although, not offered by the government, an experimental study designed by Maitra and Mani (2013) and implemented in co-operation with non-governmental organizations offers estimates of the impact of a six month stitching and tailoring training program targeted at young women (aged 18-39 years) in New Delhi. The paper examined the impact of the program six months and 18 months after program completion on a sample of 594 women (409 treatment and 185 control). According to the study's findings, in the short term, women who received training were 4 percentage points more likely to be self-employed, 6 percentage points more likely to be employed and earn 150% percent more

[6] Although their paper does not focus on disadvantaged youth but on the general unemployed population, Hirshleifer et al. (2016) use a randomised experiment to assess the effect of a large scale vocational training program in Turkey and conclude that the effect of being assigned to training had a 2 percentage point, but statistically not significant effect on the probability of being employed.

per month as compared to the control group. The effects persisted in the medium-term. While the effects are impressive, the authors report that only 56% of those assigned to treatment completed the course and that there were a number of barriers to entry, chiefly, lack of access to credit, lack of child-care support and the distance from residence to the training center.

This paper analyses the effect of a training program sponsored by the DDUGKY on employment and earnings. While it is not based on an experiment, the empirical approach which is based on comparing participants with non-participants who expressed a desire in the scheme but did not eventually join, yields an arguably credible design. We work with what may seem like a relatively small sample of 526 respondents, but it is large as compared to the total pool of trained participants and the sample size is comparable to those in Alzua et al. (2016) and Maitra and Mani (2013).

The paper is a potentially useful addition to the literature and policy debates on the relevance and usefulness of such training schemes. It offers, perhaps the first estimates of the impact of a training course sponsored by the DDUGKY. Given the resources expended on the DDUGKY and similar programs, an assessment of their effectiveness in generating employment and the cost at which they do so is sorely needed. Second, the bulk of the international literature focuses on youth training programs for disadvantaged urban youth, while this paper focuses on disadvantaged rural youth living in one of India's poorest states, that is, a group which is more likely to face a skills gap as well as other challenges compared to urban youth.[7] In principle, this is a target group for whom such skills training programs should be particularly effective.

3. DDUGKY

On September 2014, under the aegis of its National Rural Livelihood Mission, the Ministry of Rural Development (MoRD) announced the DDUGKY. The scheme targets rural families who fall below the poverty line. Individuals from such families who are in the age range 15 to 35 are

[7] For instance, in urban settings, information on the job market and accessibility to training programs may be more readily available, thus the primary determinants for decision making may be individual competitiveness and attitude. However, in a rural setting, information barriers may be more binding and accessibility to training programs may depend on gender, caste or class.

eligible for government sponsored training and post-training job placement in positions that offer regular monthly wages.[8]

The DDUGKY skilling ecosystem consists of The Ministry of Rural Development (MoRD) or the National Mission Management Unit (NMMU), State Missions, Project Implementing Agencies (PIA) and Technical Support Agencies (TSA). The MoRD is responsible for framing policy, monitoring the scheme and in collaboration with state governments, responsible for providing funds.[9] Identification of courses to be offered is based on skills gap assessment studies carried out by the National Skill Development Corporation (NSDC) as well as inputs from state missions. On the basis of these studies, DDUGKY invites tenders from private sector partners who wish to provide training. State missions are responsible for planning and implementing the program through the private sector PIA. The PIA are responsible for identifying prospective applicants, providing information on the training courses, delivering training and placing the trained graduates.

To elaborate, the PIA begins the implementation process by embarking on a process of community mobilisation and awareness building using different modes such as awareness camps, job fairs, placing banners, distributing handbills and pamphlets and door to door counselling. PIA also involve village self-help groups (SHG) and Gram Panchayats (GP) in their efforts to reach out to eligible candidates. After mobilisation, candidates who have indicated an interest in a training program are asked to complete a field registration form and are then invited for counselling. During counselling, candidates and in some instances, their parents are given information on the nature of work in the selected sector, availability of jobs, growth prospects and the challenges. The counselling sessions are also used to determine whether the applicants fulfil eligibility conditions. After counselling, the list of selected candidates is sent for approval to the state missions and once approved, the candidates may join the training program.

[8] Additional details are available on http://ddugky.gov.in/.

[9] The bulk of the funding, 75 percent, comes from the central government through the MoRD and the remainder from state governments, except for the North-Eastern states where central funding accounts for 90 percent.

Each course offered through the DDUGKY consists of two broad components. The first component includes training on soft skills, English and information technology and the second component deals with sector specific training. Depending on the course, the duration of training may be for 3 (576 hours), 6 (1,152 hours), 9 (1,578 hours) or 12 months (2,304 hours). The scheme provides for on-the-job training (OJT) ranging from a maximum permissible 30 days for a 3 month course to 120 days for a one year course. The training courses offered by the PIA have to be approved by the National Council for Vocational Training (NCVT) or Sector Skill Councils (SSCs). These TSA also provide support in terms of designing the curriculum and certifying the trained graduates.[10]

Post-training, PIA are required to place a minimum of 70 percent of trained individuals in jobs which offer regular monthly wages at or above a minimum monthly wage of Rs.6000.[11] The scheme has provisions for post-placement financial support.[12] To enhance employment sustainability all trained/placed candidates are tracked for one year. During this year they are also entitled to counselling and guidance.

As of 2016, DDUGKY operates in 21 States/Union Territories, covering 568 of India's 687 districts. The scheme offers about 690 courses in more than 330 trades catering to 82 industry sectors. The training is offered through over 300 private training partners. According to the latest reports, over 270,000 candidates have been trained and over 134,000 candidates have

[10] Two types of quality controls assessments are mandated under DDUGKY. The first is an internal and continuous assessment, which is conducted by PIA on a regular basis and monitored by the states government on a bimonthly basis. The second is third party assessment and certification of trainees by agencies approved by the National Council for Vocational Training (NCVT) or Sector Skill Councils (SSCs). It is mandatory for 70 percent of the trained candidates per batch to be certified.

[11] Proof of regular wage has to be demonstrated either by a salary slip from the human resource department of the organisation or in the absence of a human resource department, a certificate issued by the employer indicating wages paid and counter signed by the employee along with a bank statement.

[12] Candidates are entitled to post-placement financial support through the PIA. An amount of Rs.1000 per month is available for 2 months in case the placement is within the district of residence; Rs.1000 per month for 3 months if placement is outside the district but within the state of residence and Rs. 1000 per month for 6 months if placement is outside the state of residence.

been placed in jobs. Since its inception, DDUGKY has invested more than Rs.56 billion or about USD 838 million.[13]

Based on the USD 838 million spent since scheme inception and the number of individuals trained (270,000), the average amount spent per trained individual is about USD 3,100 or Rs.217, 210. If this is restricted to those who have been placed, then the average cost per placement is USD 6,250 or Rs.437,710. Details on the minimum and maximum fee that may be charged by a PIA for training candidates is provided in Table 1.[14]

4. Sampling approach and data

The sampling and data collection approaches were developed in collaboration with a local NGO, which is also a DDUGKY implementing partner.[15] The district where the data collection was carried out is located in North Bihar and was selected as the first author is conversant with the social context and the language and also because the selected district started implementing the scheme in 2014 which provides a sufficient number of trained individuals to carry out an evaluation. The selected district is not particularly different from other rural areas of Bihar. The bulk of the population is engaged in agriculture, non-farm opportunities are limited and caste remains a dominant social marker.

The NGO provided a complete list of 520 individuals who had participated in its 3 month (576 hours) residential retail sales training course and a complete list of an additional 721 applicants who had shown an explicit interest in the course and had filled the field registration form but subsequently did not pursue the process and did not participate in the course. The lists were checked to ensure that there were no duplicates and that program participants did not also appear in the list of program non-participants and vice versa. Keeping in mind statistical and budgetary considerations, about 50 percent of the participants (263 participants) and an equal

[13] http://ddugky.gov.in/content/about-us-0

[14] There are separate budget lines for the cost of training, boarding and lodging costs for residential training, transport costs for non-residential training, post placement tracking and support, incentives for the PIA for placement and post placement activities, assessment and certification.

[15] To ensure confidentiality we do not reveal the name of the district or the name of the local NGO.

number of non-participants were randomly sampled, yielding a total sample of 526 participants and non-participants.[16]

Data collection was carried out between July and August 2016 by a team led by the first author. The survey instrument gathered information on a range of individual and household socio-economic and demographic characteristics including questions on the respondent's religion, caste, age, sex, years of education, occupation, income and membership of various social programs. In addition, information on the same characteristics was also collected for parents of the respondents as well as on their land holdings and housing characteristics.

The survey gathered information on current (post-training) employment and earning status of participants and non-participants, that is, between 2 to 6 months after completion of the course. We also enquired whether they were offered jobs after training, as well as their employment and earnings status at the time that individuals applied for the training programs (pre-training). Thus, we have information on employment outcomes at three points in time, that is, pre-training, immediately after training, and 2 to 6 months after training. The pre-training information and immediate post-training employment and earnings status are both based on recall which may raise concerns about the quality of the data. However, given the short duration of the course and the relatively short time-span between program inception and the survey this is unlikely to be a problem. At most, respondents were being asked to recall their employment and earnings 9 months before the survey.[17]

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[16] Based on an employment rate of 10 percent for the control group (see Maitra and Mani, 2013) and a modest expected effect of a 10 percentage point increase in post-training employment, a sample size of 526, equally split between participants and non-participants and 5 percent probability of making a type I error has a power of 0.87. The expected effect may seem large as compared to the effects reported in the literature but it is close to the 8-10 percentage point effect on employment as reported in Maitra and Mani (2013) and Alzua et al. (2016). Given the nature of the intervention which is expected to achieve 70 percent post-program job placement, the expected effect size used to compute power is very modest.

[17] The most recently trained batch had graduated 2 months prior to the survey and the first trained batch had graduated 6 months prior to the survey. Taking into account the duration of the course it implies that pre-training or pre-application information regarding employment and earnings is based on recall periods of 5 to at most 9 months prior to the survey.

In addition to the structured survey, the instrument contained a set of open-ended questions which asked participants why they enrolled and likewise asked non-participants why they did not enrol. Additionally, for those who had been offered jobs after training and were no longer working, we also enquired why they had not continued with the jobs that they had been offered.

5. Analytical Framework

5.1 Participation in the DDUGKY

The scheme is intended for rural poor youth and the first issue that we examine is whether the program reaches its intended target group. Since the scheme is intended for below-poverty-line (BPL) families and/or if any household member participates in a self-help group (SHG), in addition to analysing the role of several individual and household socio-economic and demographic characteristics, we explicitly examine the link between being a BPL or a SHG household and program participation.

Specifically, the probability that an individual (*i*) joins the scheme (*DDUGKY* = 1) is treated as a function of individual characteristics (*I*) including, sex, age, years of education, religion and caste of the applicant; household characteristics (*H*) include age and education of parents, father's occupation, land holdings, ownerships of house, type of house, monthly income, BPL card holder and whether any member of the household is a member of a self-help group. To control for supply-side effects (*SS*), we also control for distance to the training centre. Accordingly, the probability of enrolling in the training scheme is scheme is written as,

$$p\left(DDUGKY_i = 1\right) = f\left(\alpha I_i, \theta H_i, \beta SS_i, \varepsilon_i\right) \qquad (1)$$

and several variants of (1) are estimated using a probit specification.

4.2 Impact of DDUGKY

There are two approaches that may be used to assess the impact of the DDUGKY. First, we propose to rely only on the current (post-training) outcomes and estimate the effect of having

received training on employment and earnings (y_i), after controlling for individual and household characteristics. That is,

$$y_i = f(\alpha I_i, \theta H_i, \beta DDUGKY_i, \varepsilon_i), \qquad (2)$$

where, β is the coefficient of interest.

This cross-sectional approach is likely to yield unbiased estimates only if selection into the program is based on observables. However, despite using a control group of those who had displayed an interest in the program (completed the field registration form) but did not subsequently pursue the process, it is possible that those who did eventually join are different in terms of their unobserved characteristics as compared to who did not join the scheme. For instance, participants may be more motivated which might influence their decision to participate in the training programs and may also affect their chances of finding employment. That is, $Cov(DDUGKY_i, \varepsilon_i) \neq 0$.

An alternative, since we have information on pre-training and post-training outcomes, is to estimate a value-added or panel data version of (2). That is, we estimate the extent to which changes in employment and earnings may be attributed to participation in DDUGKY after controlling for time (λ_t) and individual fixed effects (η_i). That is,

$$y_{it} = f(\beta DDUGKY_{it}, \lambda_t, \eta_i, \varepsilon_{it}) \ . \qquad (3)$$

This specification will yield unbiased estimates of the program on employment and earnings, as long as participation and outcomes are driven by time-invariant unobserved characteristics. However, if the two groups (participants and non-participants) are exposed to different time-varying idiosyncratic errors then estimates based on (3) are still likely to be biased. While this is unlikely, given that both groups reside in the same district and there is a fairly short time-span between pre- and post-training, it remains a possibility.

5. Results

5.1 Descriptive Statistics

Table 3 provides descriptive statistics. These statistics allow us to gauge whether the training program does target the rural poor and also to examine whether our empirical approach, which is based on comparing those who participate in the training program versus those who expressed an interest but did not finally participate, delivers a credible control group.

The average individual who has shown an interest (that is, both those who attend and do not attend) in the training programs is about 21 years old and has about 15 years of education. The majority of the sample (69%) is male and a similar proportion (71%) falls in the category of scheduled caste/tribe (SC/ST). Almost all the respondents (92%) belong to below-poverty-line households and 37% live in non-permanent houses. Only about 9% report that they are employed and conditional on being employed they earn about Rs. 5000 a month. The main point emerging from the descriptive statistics is that the training program is clearly well-targeted at rural poor households. For instance, the proportion of SC/ST in the sample is substantially higher than the proportion for Bihar (17.3% according to Census 2011). Similarly, the estimated head count ratio of poverty in rural Bihar is 34.3% (Reserve Bank of India, 2016) while in the sample it is more than 90%.

With regard to the individual traits of the respondents, comparison of means across the two groups shows that there are no statistically significant differences in terms of the outcome variables across the two groups. Both groups are equally likely to be employed and conditional on employment have, on average, the same monthly earnings. Age and caste composition is also similar. While the difference in educational attainment is statistically significant the difference is not substantial, 15.7 years of education for participants versus 15.3 for applicants. There are differences in the gender composition with a smaller proportion of males (66%) in the training group (66% versus 73%) and at the same time those who opt for training are more likely to be married (22% versus 13%). With regard to their household background – both groups are

equally likely to belong to below-poverty-line households, their household incomes are similar and they also have access to the same housing infrastructure. There are differences in the educational and occupational backgrounds of their parents. Those who attend training have more educated fathers (7 versus 5 years) who are more likely to be self-employed in agriculture. Consistent with the difference in occupational distribution, their families also own more land (6 versus 3 kathas). Although, the training course that they attend is residential, participants live about 5 kilometres closer to the centre than non-participants (25 versus 30 kilometres).

Overall, while not perfectly balanced, the approach of comparing those who participate versus those who register for the program but finally do not join appears to deliver an arguably credible control group. Differences across the two groups are not very pronounced. Most notably, before the training, the two groups are similar in terms of their employment and earnings outcomes as well as their caste, BPL, household income and housing quality status. There are differences in parental education, father's occupation and agricultural land holdings, however, these are likely to be time-invariant and may be partialled out while estimating the effect of training on changes in employment and earnings.

5.2 Program Participation

Notwithstanding the discussion of the participant-specific descriptive statistics which provide an idea of factors that influence participation, formal estimates of program participation are provided in Table 3. Consistent with the descriptive statistics, across the various specifications, education - both of the respondent and the father of the respondent are positively associated with participation. Married individuals are 11 to 15 percentage points more likely to participate perhaps due to a greater sense of responsibility and a desire for economic independence. As compared to all other occupational categories, children of parent's whose fathers are self-employed in agriculture are substantially more likely to seek training. The estimates show that employment in agriculture is even less attractive than working as a daily wage worker and it appears that rural youth are keen on seeking out non-agricultural opportunities. Apart from these

variables, and not surprising given the balance between the two groups, sex, age, caste, household income, agricultural land owned and poverty status have no bearing on participation.

In addition to the formal estimates, Table 4 provides information based on conversations with respondents on their reasons for joining or not-joining the scheme. As far as participants are concerned, the most common reason to enrol is their expectation that the training will increase their income (60%), followed by boosting their chances of acquiring an urban life-style (55%), their inherent interest in the course on offer (55%), the best available option at the time (52%) and an increase in their social status (49%). Although, it was not mentioned as often, 22% expected that the course would help them join "mainstream development" – which along with a desire to acquire an urban life-style, may also be interpreted as a desire to move away from rural occupations and rural areas.

Non-participants were asked who took the participation decision and to provide the single-most important reason for not-participating. In a majority of the cases (59%), individuals decided not to attend of their own volition, parents decided in 27% of the cases and for the remainder (14%), the training institute did not follow up - for no clear reason or because they did not fulfil the eligibility conditions.[18] The most commonly mentioned reason (21%) for not joining was that the expected salary (Rs. 6000 a month) post-training was not attractive enough, followed by family responsibilities (18%) and that they were seeking alternative educational opportunities (16%). Distance to the training center was mentioned by 10% of the respondents and negative feedback about the course by 6.5%.

5.2 Impact of DDUGKY

5.2.1 Employment

Tables 5 and 6 provide information on the impact of the training program on employment and earnings. Before commencement of the program the employment rates of both groups was around 8-9% and conditional on working, monthly earnings were about Rs.5000. Immediately

[18] Dropping these ineligible individuals from the non-participant sample increases comparability of the two groups but does not alter the impact of the program.

after the end of the training, about 42 percent of the participants received job placements while the share of non-participants with jobs rose from 8.4 to 12.2 percent. Formal, regression based estimates which control for time-trends and fixed-effects, yield a job offer employment impact estimate of 29 percentage points. The DDUGKY mandates that 70% of the graduates must be placed. However, as compared to the international literature on the estimates of vocational training programs on employment rates, the placement of 42% of the candidates and an impact of 29 percentage point is astounding. However, at the time of the survey, that is, about 2 to 6 months after the end of the training we find that the difference in the employment rate across the two groups is only 3.4 percentage points. Regardless of the statistical approach used, that is cross-section estimates that control for individual and household traits or fixed effect estimates, the impact of the training program on employment is statistically not different from zero. The magnitude ranges from 3 to 3.4%.

The sharp drop in employment rates within a few months after training is intriguing and led us to engage in deeper conversations with all the participants. The entire set of 153 trainees who had not been placed after training remained unemployed at the time of the survey. Of the 110 who had received placements, 42 were continuing in their positions. Of the remainder who had been placed, 33 fled their positions or were forced to leave their jobs, some within days others within a few weeks. The ostensible reason appears to be discrimination at the hands of their employers and employees. The respondents reported that they were treated harshly due to their low-caste status, most of the time by other employees and at times by employers. For instance, they were not allowed to use toilets, kitchens and to eat or sit in common areas designated for such purposes. The remaining 35 participants had been offered out-of-state placements (in urban areas) and despite the desire to access an urban life-style and seek out non-agricultural opportunities, they rejected these offers as the salaries offered were deemed to be too

low as compared to living costs.[19] Some rejected offers on the spot while others worked for a short while before returning to their homes.

5.2.2 Quality and nature of jobs

While there is no discernible effect of the program on employment status, it is possible that the training program translates into better quality of jobs as captured by higher wages and/or enhances the ability of participants to access non-agricultural jobs. Information on the impact of the training scheme on monthly earnings is provided in Tables 5 and 6. Earnings of participants does seem to be higher, however, regardless of whether we control or not for various characteristics or rely on the fixed-effects as opposed to the cross-section estimates, we are unable to detect a statistically significant impact of the training program on earnings. The occupational distribution of participants and non-participants is displayed in Table 7. There are clear differences across the two groups. While the occupational distribution of the non-participants does not exhibit much variation over time, there is a clear change in the case of participants. All those who participated and are now employed are working in the informal, non-agriculture sector in wage paying positions. Based on their desire to move away from agricultural occupations, the post-training occupational distribution is a positive development.

5.2.3 Rates of return

The training course offered by the PIA in the current analysis was budgeted at Rs.61,304 per participant. While some of the payments such as transport are based on actuals, and others only need to be paid out if targets are met, the tuition cost and the living costs of the participants or in other words the minimum cost that has to be incurred by the government for the three-month residential training course is Rs.37,439. Both the minimum cost and the budgeted cost are likely to underestimate the total cost of producing a trained graduate as these don't include payments to various other stakeholders involved in the scheme. Based on the available macro data on the total

[19] During discussions the respondents explained that if they are placed anywhere outside their home districts then expected expenditure on house rent would lie between Rs.2500 to 3000. They expect to incur between Rs.3000 to 3500 on food and other items to meet basic needs. So with a salary of Rs.6000 they do not expect to remit more than Rs.500 to their families and this is too small an amount to warrant an out-of-district placement. They repeatedly mentioned that they would be more than happy to work for a salary of Rs.6000 within the district.

resources expended on the DDUGKY since inception and the number of trained individuals, the per person cost of training a graduate is estimated to be Rs. 217,210. We work with these three cost estimates to provide a sense of the rate of return to the current training course based on achieving different employment impacts (see Table 8).

Based on the minimum cost and the estimated 3% employment effect (Table 6, column 3) the expected annual benefit on an annual salary of Rs. 72,000 amounts to Rs. 2,160. Assuming a generous 20 year return period this translates into an underwhelming internal rate of return of 1%. If individuals who had been placed but left their jobs due to discrimination had maintained their positions then the employment effect of the training course would have been 12.3 percent. Keeping all other parameters fixed, this translates into a healthy internal rate of return (IRR) of 23.3 percent. If we assume that the appropriate cost measure is the budgeted cost then the IRR drops to -3.1% for the 3% employment effect and 13.2% for the employment effect if there had been no discrimination. If we work with the estimated cost per trained graduate obtained from the macro level data then the corresponding returns for the low and high employment effects are -12.1 and -1.9, respectively. Based on this macro-level cost estimate, the employment effects needs to be at least 15% to break even and 30.6% in order to deliver an IRR of 8% which may be considered the opportunity cost of capital.

The DDUGKY scheme requires a 70% job placement rate at an annual minimum salary of Rs. 72,000 from the PIA. This is clearly an impossible target, setting aside the issue of whether such dictated job creation approaches are at all sensible. Nevertheless, what these calculations show is that on the basis of the full-cost of producing a trained graduate an employment impact estimate of about 15% yields a non-zero rate of return. This is not an impossible target and in the case of the training program under scrutiny the employment impact corrected for discrimination (12.3%) is not so far from the employment impact needed to deliver positive returns.

6. Concluding remarks

Since 2014, the government of India has launched a number of skills training and job placement schemes. While substantial resources are being expended on this and similar schemes, there is very little evidence on their effectiveness in reaching their intended target and in generating employment opportunities.

This paper focused on evaluating the effects of one of the most prominent all-India schemes, the 'Deen Dayal Upadhayay Grameen Kaushal Yojana' (DDUGKY), which targets rural youth from poor families. That is, a group which is most likely to face a skills gap and for whom such skills training programs should be particularly effective. We focused on the effects of the scheme in rural Bihar, one of India's poorest states. The analysis was based on comparing individuals who had attended a training course sponsored through the scheme with individuals who had applied but did not eventually attend the training.

The empirical approach delivered comparable groups. Our assessment showed that the scheme is very well targeted and more than 90% of those who attended the training and showed an interest in the scheme belonged to below-poverty-line families. With regard to employment effects, 42% of the graduates were placed immediately after the training, which translates into a 29% percentage point impact of training on employment. However, these gains were short-lived and within two to six months after training, the impact of the scheme on employment was statistically not different from zero. About a third of the placed graduates left their jobs due to caste discrimination and a third exited as the salaries offered were too low as compared to their expected living costs. While employment effects were zero, the training did help graduates move from agricultural to non-agricultural positions.

The analysis presented here focused on one training course in one district of rural Bihar. While this paper does not paint a very optimistic picture of scheme-induced employment effects nor is it overtly negative about the scheme itself. Indeed, in the current case the positive effects of the scheme appear to have been partially undone by deep-rooted discrimination. It is entirely

possible that other courses offered in other parts of the country are able to achieve higher placement rates and that trained graduates are not subject to post-placement discrimination.[20] Notwithstanding this possibility, what this paper highlights is the urgent need for credible analyses of the slew of skills and job training programs that have recently been launched by the government. These analyses should focus not only on initial job placement but also examine employment status after a time lag. Finally, while simply dictating job creation through such skills training courses and demanding 70% placement is unlikely to succeed, the analysis presented here shows that employment effects in the range of about 15% are likely to deliver a non-zero return.

[20] The placement rate of 42% achieved by the current course immediately after training is not very different from the macro figures for DDUGKY which show an initial job placement rate of 49.6%.

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Table 1
Cost per Candidate

For residential training				
Duration in months	3	6	9	12
Minimum cost per candidate (Rs.)	37,439	69,778	1,03,116	1,35,455
Maximum cost per candidate including incentives for PIA (Rs.)	89,197	1,41,795	1,95,392	2,47,990
For non-residential training				
Minimum cost per candidate (Rs.)	30,689	56,278	82,866	108,455
Maximum cost per candidate including incentives for PIA (Rs.)	81,197	115,795	151,392	185,990

Table 2
Descriptive statistics conditional on DDU-GKY participation

Variable	DDU-GKY				p-value	Total	
	Participant		Non-participant				
	Mean	SD	Mean	SD		Mean	SD
Individual characteristics							
Sex (1 = Male)	0.66		0.73		0.072	0.69	
Age	21.0	2.84	20.7	2.80	0.170	20.8	2.83
Years of education	15.7	1.62	15.3	1.92	0.020	15.5	1.79
Married (1 = Married)	0.22		0.13		0.012	0.18	
Number of Children	0.20	0.73	0.23	1.90	0.815	0.21	1.44
Muslim	0.06		0.11		0.034	0.09	
General caste	0.11		0.14		0.385	0.13	
Schedule caste	0.70		0.73		0.464	0.71	
Schedule tribe	0.02		0.00		0.013	0.01	
Other backward caste	0.15		0.12		0.300	0.14	
Household characteristics							
Age of father	51.0	11.2	52.4	36.8	0.541	51.7	27.2
Age of mother	46.3	8.61	46.5	6.52	0.828	46.4	7.63
Years of education of father	6.95	6.13	5.13	5.76	0.000	6.04	6.01
Years of education of mother	2.89	4.83	2.18	4.35	0.075	2.54	4.60
Father's main occupation – unengaged in economic activity	0.06		0.04		0.167	0.05	
Father's main occupation – self-employed in agriculture	0.47		0.28		0.000	0.37	
Father's main occupation – self-employed in non-agriculture	0.10		0.16		0.042	0.13	
Father's main occupation – informal regular wage, non-agri.	0.03		0.05		0.136	0.04	
Father's main occupation – formal regular wage, non-agri.	0.03		0.02		0.589	0.02	
Father's main occupation – daily wage worker	0.29		0.43		0.001	0.36	
Number of earning members in family	1.20	0.47	1.11	0.32	0.018	1.16	0.40
Monthly household income in rupees – pre-training	6860	4312	7246	5318	0.361	7053	4841
Incidence of land ownership	0.44		0.33		0.009	0.39	
Land owned in local unit (katha; 1 katha = 126m^2)	6.20	11.8	3.18	6.45	0.000	4.69	9.63
Katcha (non-permanent) house	0.36		0.38		0.677	0.37	
Semi-Pucca (semi-permanent) house	0.24		0.21		0.396	0.23	
Pucca (permanent) house – financed by government scheme	0.29		0.26		0.542	0.27	
Pucca (permanent) house – self-financed	0.09		0.13		0.220	0.11	
Below-poverty-line (BPL) household	0.92		0.93		0.486	0.92	
Self-help group (SHG) household	0.75		0.63		0.003	0.69	
Supply-side							
Distance to the training center (km)	25.3	38.4	30.3	17.8	0.060	27.8	30.0
Outcome variables – pre-training							
Employment status	0.087		0.084		0.876	0.086	
Monthly earnings	427	1547	449	1780	0.877	438	1666
Monthly earnings conditional on working	4881	2404	5372	3435	0.579	5121	2930
Observations	261-263		260-263		521-526	521-526	

Notes: Standard deviations reported only for continuous variables.

Table 3
Probability of participating in the training programs - marginal effects after probit (std. error)

Variables	(1)	(2)	(3)
Individual Characteristics			
Sex	-0.1012*	-0.0513	-0.0437
	(0.05773)	(0.06326)	(0.064)
Age	0.0016	0.0046	0.0033
	(0.01003)	(0.01122)	(0.01123)
Years of education	0.0381***	0.0301**	0.0322**
	(0.01449)	(0.0156)	(0.01574)
Married	0.1154*	0.1570**	0.1464**
	(0.07115)	(0.07377)	(0.07485)
Number of Children	-0.0265	-0.0265	-0.0244
	(0.027)	(0.03211)	(0.02994)
Muslim	-0.1854*	-0.0728	-0.0835
	(0.10227)	(0.11726)	(0.11702)
Schedule caste	-0.0567	0.0386	0.0490
	(0.09846)	(0.10443)	(0.10476)
Other backward caste	-0.0197	0.0594	0.0661
	(0.10598)	(0.11271)	(0.11288)
Household characteristics			
Age of father	.	-0.0007	-0.0006
		(0.00114)	(0.00113)
Age of mother	.	-0.0029	-0.0028
		(0.00337)	(0.00339)
Years of education of father	.	0.0120***	0.0116***
		(0.00496)	(0.00498)
Years of education of mother	.	0.0016	0.0015
		(0.00698)	(0.007)
Father's main occupation – unengaged in economic activity	.	0.0314	0.0310
		(0.11412)	(0.11452)
Father's main occupation – self-employed in non-agriculture	.	-0.2290***	-0.2277***
		(0.07089)	(0.07096)
Father's main occupation – informal regular wage earning (non-agriculture)	.	-0.2779***	-0.2744***
		(0.0979)	(0.09859)
Father's main occupation – formal regular wage earning (non-agriculture)	.	-0.0218	-0.0098
		(0.16016)	(0.16109)
Father's main occupation – daily wage worker	.	-0.1790***	-0.1852***
		(0.05577)	(0.05598)
Number of earning members in family	.	0.1610***	0.1604***
		(0.0625)	(0.06275)
Monthly household income in Rupees – pre-training	.	-0.0582	-0.0594
		(0.0605)	(0.06063)
Land owned in local unit (katha; 1 katha = 126m2)	.	0.0046	0.0043
		(0.003)	(0.00299)
Katcha (non-permanent) house	.	0.1285	0.1354
		(0.08403)	(0.0847)
Semi-Pucca (semi-permanent) house	.	0.1894**	0.1987**
		(0.08528)	(0.0857)
Pucca (permanent) house – financed by government scheme	.	0.1171	0.1355
		(0.08864)	(0.08926)
Below-poverty-line household	.	-0.0314	-0.0380
		(0.10253)	(0.10274)
Self-help group household	.	0.1607***	0.1657***
		(0.05149)	(0.05153)
Supply-side			
Distance to the training centre (km)	.	.	-0.0012*
			(0.00069)
Observations	512	509	509
Pseudo R-squared	0.0303	0.1133	0.1175
Log pseudo likelihood	-344.09318	-312.72348	-310.61427

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 4
Reasons for participating and not participating

Reason (%)	Participants
Low opportunity cost/best option at that time	52 (137)
Increase in income	60 (158)
Increase in social status	49 (130)
Long-term future prospects	41 (108)
Urban life style	55 (144)
Join mainstream development	22 (57)
Inclination to service/jobs	55 (145)
	Non-part.
Own decision	**59 (155)**
Negative feedback from participants	6.5 (17)
Seeking educational opportunities	16.3 (43)
Unattractive salary prospects	21 (56)
Not interested	4.6 (12)
Distance to training center	10.3 (27)
Family decision	**27 (71)**
Family responsibilities	18.3 (48)
Marriage	8 (3)
Parents did not allow	5.7 (15)
Decision of training organization	**14 (37)**
Not BPL or SHG	7.2 (19)
Under Age	1.5 (4)
Training organization did not contact	5.3 (14)

Notes: For those who participated, multiple responses were possible. Non-participants were asked to indicate who decided and the most important reason for not participating. Number of observations are reported in parentheses.

Table 5
Pre-Training, immediate post-training and current outcomes

Outcomes	Pre-training		Immediately after training		Post-training (at time of survey)	
	Part.	Non- Part.	Part.	Non-Part.	Part.	Non-part.
Employed (%)	8.74	8.4	41.8	12.5	16.0	12.5
N	*23*	*22*	*110*	*33*	*42*	*33*
Not offered a job (%)	.	.	58.2	.	58.2	.
N			*153*		*153*	
Left job due to caste discrimination (%)	.	.	.	.	12.5	.
N					*33*	
Left job-out-of-state state placement and low salary	.	.	.	.	13	.
N					*35*	
Monthly earnings (Rupees)	426.8	449	.	.	933.5	727
	(1547)	(1780)			(2456)	(2218)
Monthly earnings if employed (Rupees)	4881	5372	.	.	5845	5791
	(2404)	(3435)			(3023)	(3168)

Notes: The total number of observations is 263 for participants and 263 for non-participants. Standard deviations for continuous variables are in parentheses. Post-training refers to outcomes between 2 to 6 months after training.

Table 6
Effect of training programs on employment and earnings (std. error)

Variables	Employment						Earnings		
	Immediately after training			Post-training					
	OLS (Cross-section) (1)	OLS (Cross-section) (2)	OLS-FE (Panel) (3)	OLS (Cross-section) (4)	OLS (Cross-section) (5)	OLS-FE (Panel) (6)	OLS (Cross-section) (7)	OLS (Cross-section) (8)	OLS-FE (Panel) (9)
Training Program	0.293***	0.294***	0.289***	0.034	0.032	0.030	206	193	229
	(0.037)	(0.038)	(0.032)	(0.031)	(0.032)	(0.022)	(204)	(208)	(149)
Time Period–Post-Training	.	.	0.042	.	.	0.042***	.	.	277***
			(0.022)			(0.0153)			(105)
Observations	526	514	1052	526	514	1052	526	514	1052
Individuals	526	514	526	526	514	526	526	514	526
R-squared	0.108	0.232	0.764	0.002	0.197	0.845	0.002	0.141	0.824

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Estimates in columns 2 and 5 control for all the individual and household Characteristics included in the participation regression (see Table 2). Estimates in column 3 and 6 control for individual fixed effects (FE).

Table 7
Pre-Training and Post-Training – Occupational distribution

Outcomes	Pre-training		Post-training (at time of survey)	
Nature of employment	Part.	Non- Part.	Part.	Non-part.
Unengaged in economic activity	91.3	91.6	84.0	87.4
Self-employed in agriculture	0.40	0.40	.	.
Self-employed in non-agriculture	.	2.28	.	3.44
Informal regular wage, non-agri.	2.28	1.52	16.0	1.91
Formal regular wage, non-agri.	0.38	0.38	.	0.38
Daily wage worker	5.70	3.80	.	6.87

Table 8
Internal rate of return – private perspective

	Cost/ Benefit (Rs.)	**Combination (Rs.)**	**Returns**[h] (%)
(i) Minimum cost of three month residential training [a]	37,439	(i)-(iv)	1.0
(ii) Budgeted cost of three month residential training [b]	61,304	(i)-(v)	23.3
(iii) Cost of training based on total budget/trained individuals [c]	217,210	(ii)-(iv)	-3.1
(iv) Annual expected benefit - employment effect (3%)[d]	2,160	(ii)-(v)	13.2
(v) Annual expected benefit - employment effect (12.3%)[e]	8,856	(iii)-(iv)	-12.1
(vi) Annual expected benefit – employment effect (15.0%)[f]	10,900	(iii)-(v)	-1.9
(vii) Annual expected benefit – employment effect (30.6 %)[g]	22,500	(iii)-(vi)	0.0
		(iii)-(vii)	8.0

Notes:

[a] The minimum cost includes the tuition and boarding and lodging costs of one individual who attends the three month course offered by the project implementing agency.

[b] The budgeted cost is the potential amount which ***may*** have to be paid out to the project implementing agency and includes items to be paid out in actuals and performance related payments.

[c] The cost figure here is based on total DDUGKY costs and individuals trained since inception till end-2016.

[d] The expected benefit is based on annual earnings of Rs. 72,000 and a 3% increase in the probability of obtaining a job due to the training scheme.

[e] The expected benefit is based on annual earnings of Rs. 72,000 and a 12.3% increase in the probability of obtaining a job, that is, the increase in employment probability if there had been no discrimination.

[f] The expected benefit based on annual earning of Rs. 72,000 and a 15% increase in the probability of obtaining a job due to the training scheme. This is the employment effect which would lead to breakeven based on an estimated cost of Rs. 217,210 per trained graduate.

[g] The expected benefit based on annual earning of Rs.72,000 and a 32% increase in the probability of obtaining a job due to the training scheme. This is the employment effect which would lead to a return of 8.5% on an estimated cost of Rs. 217,210 per trained graduate. The rate of return on a one-year term deposit in selected Indian banks in 2017 is about 8%. This may be viewed as the opportunity cost of capital.

[h] The duration of the payback period is set at twenty years and benefits are fixed for the this duration.