



working paper
2017-12

Impact of short term vocational training on youth unemployment: Evidence from Mongolia

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March 2017



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Abstract

Mongolia is a lower-middle income country characterized by high youth unemployment and a large informal sector. Training programs have been implemented in order to promote employment and tackle these issues. In this study, we evaluate the impact of a vocational training program (VTP) through a field experiment conducted between 2013 and 2015. This time frame allows us to explore short and medium term impacts. In particular, we focus on three outcomes of interest: employment, earnings and job quality. We find a positive and short-term impact on employment and a positive impact on monthly earnings in short and medium terms. We also show that providing information about schooling returns increases attendance and reduces dropout, which may help improve the program's impact in non-expensive ways.

Keyword: vocational training programs, labor market, randomized controlled trial, employment, earnings, job quality.

JEL: J18, J08, J24, J38, C93

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Acknowledgements

This research work was carried out with financial and scientific support from the Partnership for Economic Policy (PEP) (www.pep-net.org) with funding from the Department for International Development (DFID) of the United Kingdom (or UK Aid), and the Government of Canada through the International Development Research Center (IDRC).

Table of contents

I.	Introduction	p.1
II.	Literature review	p.3
III.	Context and program description	p.5
3.1.	Context	
3.2.	Program description	
IV.	Experimental design	p.8
4.1.	Baseline and power calculations	
4.2.	Randomization	
4.3.	No-shows	
4.4.	Data collection	
V.	Estimations	p.14
5.1.	First estimations results: employment, wages and job quality	
5.2.	Discussion	
5.3.	Second treatment results: attendance and dropouts	
VI.	Policy recommendations	p.22
VII.	Final remarks	p.23
	Reference	p.25
	Tables and figures	p.27

List of tables

Table 1. Reasons for no-show.....	27
Table 2. Classification of treatment groups.....	27
Table 3. Randomization of the second treatment.....	27
Table 4. Comparison of socio-demographic characteristic of NEET youths and experiment sample.....	27
Table 5. Baseline balance and attritions.....	28
Table 6. Baseline balance by Treatment 1, Treatment 2 and Control.....	29
Table 7. Follow-up summary statistics.....	30
Table 8. Impacts of Treatment 2 on outcome variables.....	31
Table 9. Estimations: Take-up rate.....	32
Table 10. ITT effects of training on labor market outcomes.....	33
Table 11. TOT effects of training on labor market outcomes.....	34

I. Introduction

More than half of the population in low and lower-middle income countries is younger than 26, and the large majority of them lack a decent job.¹ According to the Global Employment Trends for Youth (2015), in 2014, the global unemployment rate for youth was 13%, and since 1995 it has been almost three times the adult rate.

These numbers are alarming for many reasons. In particular, it has been shown that unemployment at a younger age strongly and negatively affects prospects for future labor market outcomes, especially in terms of wages, employment and suboptimal investment in human capital (Mroz & Savage, 2005; Bell & Blanch flower, 2011). This explains why promoting youth employment has become a top policy priority in most countries (ILO, 2015).

Mongolia, for instance, is one of these countries. In 2015, more than half its population was younger than 30 (the share of people between 15 and 29 years old being almost 27%), and the unemployment rate among youth is extremely high: in 2014, it was 17.4%, which is 4.4 points above the global rate.

Moreover, the country also has a large rate of youth inactivity; that is, young people who are not in education, employment or training (NEET). More specifically, according to Shatz et al. (2015), one fourth of this population who are aged between 15 and 29 are NEET and this share is higher among those with unemployed parents, those who are poorer and less educated. Hence, youth employment promotion is one of the highest priorities in Mongolia.

One example of the country's policies to promote this type of employment is the Vocational Training Program (VTP), the program we study in this paper. The VTP seeks to promote employment among poor NEET by providing them with vocational skills. The Metropolitan Employment Department (MED) is the entity in charge of its implementation. The Mongolian VTP program is different from others in many ways. In particular, it is a very short-term program (from 21 to 45 days), and in general, it does not target youth or unemployed exclusively.

¹ Authors' calculations based on median age data for the regions in the World Health Statistics (2015).

In order to identify its causal impact, we exploit a random assignment rule implemented in two stages. In the first stage, the government invites a sample of unemployed or inactive youth to apply. Then, the government assigns them to either a training treatment group or a control group. In the first case, the government pays participants' tuition fees, ranging from \$100 to \$150 US dollars and enrolls them into 20 to 45 days of training in their chosen vocational skill, of which they have a choice of 80 different skills. Of these 80 skills, participants applied to 66 different skills training programs. The 5 most popular vocations were beauty specialist, hairdresser, cook, sales assistant and childcare assistant.

The pool of applicants was younger than 23 and unemployed. Moreover, they had an average of 10 years of education, belonged to households with a daily income of less than \$3 US dollars and had less than 2 years of professional work experience. In total, 432 participants were trained in 47 training institutions². The drop-out rate among trainees was lower than 10%.

The second stage consisted of randomly assigning classes of trainees into an information treatment: a letter with general information about labor market outcomes of skilled workers. This last treatment had the purpose of increasing attendance rates, following Jensen (2010), who suggests that perceived returns may affect schooling decisions. In actual fact, we did find an improvement in attendance rates and a decrease in dropout rates.

Following Galdo and Chong (2012), who found that the most important characteristic of training programs is expenditure per trainee, we collected administrative data on training quality during baseline data collection. Out of 47 training institutions³, 46 (representing 94.9% of trainees in our intervention) provided information about the number of instructors and classrooms, average class size, expenditure per student and monthly instructors' salary, etc. Average expenditure per trainee was approximately \$100 US dollars. We estimated the effects of VTP on employment, earnings and job quality. We found it has a positive but short-term impact on employment, and a positive impact on monthly

² In 2013, the Ministry of Labor selected 75 training institutions, which offered training in 79 different vocations. The 432 applicants in this study were trained by 47 of the 75 institutions.

earnings, both in the short and medium-term. However, we did not find an improvement in job quality in any dimension.

This paper is organized as follows. In the second section, we summarize the relevant literature. The third section describes the context, program design and implementation. In the fourth section, we discuss our experimental design. In section 5, we present the results. In section 6, we propose some policy recommendations. Section 7 concludes.

II. Literature review

There is extensive literature on the impact of Active Labor Market Programs (ALMP) in OECD countries. However, the evidence is mixed: some papers find no impact at all, while others find moderate positive impacts on employment and earnings.

According to Heckman, LaLonde and Smith (1999), studies of training programs in the United States and Europe show at best moderate impacts, with substantial heterogeneity. On the other hand, a recent meta-analysis of 199 programs in the OECD by Card Kluve and Weber, (2010) showed that classroom or on-the-job training tend to have no impact in the short-term, but they do have medium-term impacts. Moreover, those programs targeting youth are less likely to have an impact, while there is no systematic difference by gender.

As for other available experimental evidence, Hirshleifer, McKenzie, Almeida and Ridao-Cano (2015) evaluated Turkish vocational training programs, exploiting access to administrative data on formal employment. They found short-term impacts only on the formality of a program that combines paid training plus a small stipend for three months.

Experimental studies in developing countries are limited and mostly from Latin American. Among them there are some impact evaluations provided optimistic results. For example, Ibararán and Shady (2008), a summary of findings from evaluations to job training programs in Latin American countries, reported from modest to meaningful positive effects on employment rate. Also Card, Ibararán, Regalia, Rosas-Shady and Soares (2011) conducted a randomized impact evaluation of a 4-month youth training program in the Dominican Republic, which focused on both technical and soft skills. They found a

moderate positive effect on employment and some stronger evidence of an impact on earnings and formality for men.

Similarly, Attanasio, Kugler and Meghir (2011) focused on a subsidized program for poor and unemployed youth from urban areas of Colombia, and found positive impacts on earnings, employment and job formality for men and women. They also conducted a cost-benefit analysis from which they estimated a high rate of return; they argue that lack of information and credit constraints may be the reasons why people do not take advantage of existing training opportunities.

In a randomized study of an Argentinean training program for low-income youth, Alzua, Cruces and Lopez (2015) exploited administrative data and found sizeable short-term effects on employment and earnings, although these effects seemed to dissipate in the medium and long term.

There is also some experimental evidence from non-Latin-American countries. Cho, Kalomba, Mobarak and Orozco (2013), for instance, examined the impact of a vocational and entrepreneurial training program in Malawi. They found positive effects on skills development, investment in human capital and well-being, but no impact on labor market outcomes in the short-term.

The study by Maitra and Mani (2013) is, to our knowledge, the only experimental study of vocational training in Asia. They evaluated a subsidized stitching and tailoring program for poor youth and women in India, organized by NGOs, and found positive short and long term impacts on employment, earnings and working hours.

In Mongolia, the labor market is still one of the least studied areas and most of the existing literature is limited to reports and surveys conducted by NSO and ILO. While these reports provide useful insights into the overall labor market performance, they suffer from typical aggregation bias and do not control for the individual level effects considered in this analysis.

There are no other papers that study the impact of the ALMP either, even though the government has acknowledged the importance of research in order to improve labor promotion policy (Millennium Development Goals Implementation, 2011).

III. Context and program description

3.1. Context

Mongolia is a small, transition country with a population of approximately 3,057. It has an area of 1,564.1 sq. km and is sandwiched between Russia and China.⁴ The population over 15 years of age was 2,152.8 in 2015. Mongolia's population is young: almost 29.6% of people were younger than 15 in 2015, and the share of people between 15 and 30 years old was 28.8% (almost a third).

In 2015, GDP per capita was \$3,967.8 US dollars (current US dollars).⁵ As Mongolia is a resource rich country, the largest economic sector is mining, which produces almost one fifth of GDP. The country also has a dominant informal sector, underemployment and low productivity employment. Agriculture is the largest employer, which hires 30% of workers.

In 1990, its economy changed from a centrally planned command system to a market system. Before the transition, the labor market was characterized by high labor force participation (75.8% in 1992) and no unemployment due to everyone should work policy.

In 1992, Mongolia started to measure and report unemployment. After the economic reform and mainly due to structural changes, such as privatization and price liberalization, labor force participation starting falling and unemployment is now on the rise.

In response to these changes, Mongolia adopted active labor market policies to promote employment. In particular, in 2003, the government introduced a short-term vocational training program (VTP): the oldest and the largest active labor market policy so far.

Moreover, the labor market is characterized by an extremely high youth unemployment rate; 20% as reported by the 2010 Population Census. The government committed to reducing this rate to 2.5% by 2015.⁶

⁴ Mongolian Statistical Information Service, <http://1212.mn>

⁵ World Bank, WDI, <http://data.worldbank.org/>

⁶ Comprehensive policy on National Development based on the MDGs, Government of Mongolia, 2008.

However, by 2014, the youth unemployment rate was still very high: 17.4% or 4.4 points larger than the global rate of 13%. Moreover, Mongolia has a large number of inactive youth who are not in education, employment or training (NEET). In fact, according to Shatz et al. (2015), one fourth of youth from 15 to 29 years old were NEET, and this share was even higher for those whose parents were unemployed, less educated or poorer. Hence, youth employment promotion is a top priority in Mongolia.

3.2. Program's description

The short-term vocational training program (VTP) was introduced in 2003. The program's primary goal consists of promoting employment by providing vocational skills through training.⁷ As stated by the Labor Promotion Training Rule, the program must select highly demanded vocations by local employers. In 2013, there were 80 vocational skills programs provided by the VTP, which included heavy machinery operating, hairdressing, cooking, and various types of construction work, among others.

The target population is unemployed youth between 15 and 30 who want to get vocational training. Participating in the VTP gives them an opportunity to improve their skills and competitiveness in the labor market in the short-term, by increasing their odds of getting a job and thus their income.

According to the Ministry of Labor, in 2011, the total number of participants was 8,000 and the total program expenditure was approximately 3.5 billion Mongolian tugriks, equivalent to 2.1 million US dollars⁸. The Employment Promotion Service Center (EPSC) of the Ministry of Labor is responsible for the overall design of the program and selection of training institutions. It is financed by the State Employment Promotion Fund and is targeted at the unemployed or those vulnerable to unemployment, youth not enrolled in formal education, and low-income citizens.

The EPSC selects training institutions through a competitive bidding process. Institutions have to show their ability to provide adequate training at the time of submitting their bids. According to the Labor Promotion Training Rule, the selection criteria for training

⁷ Labor Promotion Training Rule, Ministry of Labor.

⁸ In 2013, the actual spending was less than the originally planned spending of 4.4 billion Mongolian tugriks due to a budget review.

institutions includes legal registration, curriculum quality, teaching quality, adequacy of training places and the ability to place trainees in internship positions with registered employers. In 2013, 75 institutions were selected for VTP. Approximately, 15% of them were non-profit and 85% were for-profit institutions.

The length of the training varies from 20 days to 45 days, depending on the type of vocation, with a minimum duration of 144 hours. Each training program consists of classroom training and a subsequent internship to provide on-the-job work experience. According to the Labor Promotion Training Rule, classroom teaching -or theoretical sessions- should not exceed 30% of the 144 total hours. The second part of the training is split into practical training and internships. Compared to other training programs in Latin America (Alzua, Cruces & Lopez, 2015; Card et al., 2011), VTP in Mongolia is much shorter and thus, less expensive.

In Ulaanbaatar, the Metropolitan Employment Department (MED) implements the VTP once a year, from April to November. The MED signs a contract with the selected institutions and monitors the courses. In 2013, the program budget was 500.0 million Mongolian tugriks, approximately \$320, 000 US dollars⁹ and there was a total of 2, 794 trainees.

There were 2, 794 available slots for trainees in 2013. The VTP only pays tuition for trainees and there are no additional benefits. In 2013, the tuition fee was between 140, 000 Mongolian tugriks (approximately \$90 US dollars) and 220, 000 Mongolian tugriks (approximately \$140 US dollars). The MED pays tuition fees in four installments using vouchers, which are valid only with trainee's signatures. Value of one voucher is between 10, 000 and 20, 000 Mongolian tugriks.

In order to be considered for the program, an applicant has to meet with his or her respective Khoroo¹⁰ office and apply for the program. A khoroo officer then screens the application for eligibility and sends all eligible applicants to a district labor officer, where they choose a training institution with available slots for his or her preferred vocational skill.

⁹ In 2013, the actual spending was less than the original planned spending of 4.4 billion Mongolian tugriks due to a budget review.

¹⁰ Khoroo is an administrative unit and there are 158 khoros in 9 districts of Ulaanbaatar.

Then, in order to participate in the program, the applicant must sign a contract with the MED. Traditionally, participants were required to sign a trilateral contract: between the participant, the district officer and the MED officer. In spring 2013, for some of the programs, the EPSC modified the contract into a quadrilateral: between the participant, the district officer, the MED officer and the employer. This means a participant must find an employer in order to sign a quadrilateral contract and be accepted into the program.

IV. Experimental design

4.1. Baseline and power calculations

We established our experimental design in conjunction with the MED from the beginning of the project. Participants assigned to the treatment group received training funded by the MED.

We conducted power calculations to determine sample size. We reckoned that the short-term effect of VTP on employment might be around 3 percentage points. Moreover, based on data about trainee employment rate provided by the MED and the Ministry of Labor, we estimated a standard deviation of 0.18. They informed us that the dropout rate was around 20%. We used a more conservative rate of 30% in our estimations.

The original sample size of the baseline survey was set at 2,100 individuals of which we would assign 1,400 to the treatment group and 700 to the control group, to be able to detect our 3 percentage points estimated effect, with a power of 80% and a drop-out rate of 30%.

However, due to budget revisions, the city declined planned quotas and thus, the sample size was reduced. In order to compensate for this, we agreed to train more participants using research funds from PEP and continued recruitment after the official registration process by MED was completed (November 22, 2013).

Additional registration started on February 7, 2014 and their training continued until April, 2014. At this stage, we attempted to replicate the original training program design for additional applicants. In order to fill slots with unemployed youth, a priority of MED, we

promoted VTP through a TV program broadcasted via three TV channels, radio advertisements and a radio talk show broadcasted via four FM radios. We also distributed two types of posters to Khoroo offices.

Registration took place between August 26th and November 22th of 2013. In total, the process lasted 12 weeks. During this stage, we followed the regular registration process of the MED, which consisted of the following stages: First, khoroo officials screened applicant eligibility and sent eligible applicants to the district labor divisions. In particular, the VTP targets people who are unemployed, vulnerable to unemployment, those having difficulty finding a job and school dropouts in the labor force.

Secondly, district officials checked place availability for the chosen vocation and provided the contract form if a place was available. Depending on both vocations and training institutions, some applicants had to sign an agreement with an employer, while other applicants did not need to. Once the contract was signed by all the parties – employer, district officer and participants- applicants went to the MED office to receive the training certificate which the MED officer also had to sign.

4.2. Randomization

Randomization was implemented after the first stage of the registration process. Khoroo officials were instructed to register applicants normally. At the moment of registration, they had to ask young applicants -between 15 and 30 years old- to an interview for the baseline survey and tell them they may not be selected for training.

At the end of every workday, we called khoroo officials for the lists of applicants' names. Based on those lists, we conducted randomization at the individual level on a daily basis. Individuals were then informed if they were selected to be trained or not.

We first set the probability of being assigned to the control group at 1/3 and the probability of being assigned to either treatment at 2/3, replicating usual proportions for the VTP. We randomized 1, 188 applicants who met the selection criteria. As shown in Table 2, 774 applicants (65.2%) were originally assigned to the treatment group, while 414 (34.8%) were assigned to the control group.

We then assigned the second treatment among those who had been already selected and had started their training. This time, random assignment was carried out at a class level, rather than at an individual level, to prevent spill-over effects.

The class size of short-term vocational training varies highly across training institutions depending on vocation demand and nature (from 3 to 30 students). Class size in our intervention was 9.6 students, on average.

However, some of our classes were particularly small because of the on-going registration process of MED. Since applicants could apply any time of the year between May and November, it was not possible for training institutions to wait until the class was complete with MED-funded students. Therefore, training institutions recruit privately funded students too. In other words, some classes were made up of students who paid for training themselves and those funded by MED.

Each class had a probability of 2/3 of being assigned to the treatment group and 1/3 of being assigned to the control group. 141 classes (with 410 students) were randomly assigned to the second treatment¹¹. Then, 101 classes (291 students) were assigned to the information treatment, while 40 classes (119 students) were assigned to the no-information treatment.

We delivered a letter with information about labor market outcomes of skilled and unskilled workers in Mongolia to trainees in the treatment group, every Friday.

4.3. No-shows

Of the 774 applicants assigned to the treatment, 342 did not show up for training (44.2%). This evidence indicates that one of the main problems for short-term vocational training programs might be low intake rate. Participants who did not show up stopped their enrollment process just after the second stage of registration.

Table 1 presents reasons for no-shows. Most participants (35.1%) did not show-up for personal reasons such as childcare (6.7%), pregnancy/birth (5.8%), not interested (6.7%),

¹¹ First 22 students, who graduated before October 30, were not randomized in the second treatment.

among others. 30% got a job after registration in the program and 31% did not show up due to some VTP related reason.

Due to the large number of no-shows, trained applicants may have differed from untrained ones in their unobservable characteristics. Therefore, we needed to test whether take-ups had different characteristics to no-shows. Table 9 shows the results from regressions of the probability of taking up based on baseline characteristics. Take up is strongly correlated with schooling years, previous work experience, contract type, very optimistic expectation of getting a job, and ambition to succeed in the labor market. Given these correlations, we cannot claim that take-up for training is random. To overcome this selection problem, we estimated the impact of the program with an instrumental variables method.

4.4. Data collection

We conducted three surveys: a baseline survey (between August 2013 and November 2013), a first follow-up survey (between June 2014 and November 2014) and a second follow-up survey (between June 2015 and November 2015). The baseline survey collected information on individuals before their participation in the program. The first follow-up survey collected information on individuals 6 months after training for trainees, or just after the baseline survey for the control group. The second follow-up survey was conducted one year after the first follow-up survey.

Our mean differences test (Columns 5-8 in Table 5) shows that attrition in the first follow-up was related to dwelling type, household size, income per capita below poverty line, ambition to succeed in the labor market and opinion on how much responsibility the government has in getting him/her a job. However, differences are close to zero. Although attrition did not seem to be random, it was very low and affected both treatment and control groups equally. Even so, we controlled for attrition in our estimations.

A mean differences test shows that attrition in the second follow-up was correlated with several variables including gender, dwelling type, marriage, work experience and opinion on how much responsibility the government has in getting him/her a job (columns

9-12 of Table 5). For the sake of robustness, we controlled for all of these characteristics in our estimations.

We also collected additional information from training institutions. In total, 432 participants were trained in 47 training institutions¹², whereas 46 institutions provided information about the number of instructors, number of classrooms, average class size, expenditures per student and monthly salary of instructors, among other variables. These 46 institutions trained 410 participants (94.9 %) in our intervention.

4.4.1. Descriptive Statistics

The baseline and follow-up surveys collected information on demographic characteristics, such as age, gender, dwelling type, household size and marital status. We also asked about education, household income, labor experience and training.

In addition to labor market outcomes, we asked about applicants' plans for completing training, their expectations of finding a job and his or her ambition to succeed in the labor market. We also asked whether the applicant thought it was the government's responsibility or their own to find a job.

According to our baseline data, the average participant age was 23 and 65% of them were female. Most of them (82.4%) lived in ger area¹³ and more than half of the participants (54.7%) lived in a household with income below the poverty line. One third of the participants were married and their average number of schooling years was 10.8 (high school).

Although 61.7% of participants had work experience, only 10.8% of them were employed during the week before our baseline interview was conducted. About one third were unemployed, which means that 58.9% were inactive. Also, 20.8% had participated in vocational training before our intervention.

On average, the chance of finding a job in the six months following the training was evaluated as 78.3%, and 68% had very optimistic expectations. About 90% said they were very ambitious to succeed in the job market. The importance of one's own responsibility for

¹³ "Ger" is a portable, round tent and it is a Mongolian traditional dwelling. Ger area is named after it as ger is the most prevalent type of dwelling in this area. Ger area in Ulaanbaatar is a poor neighborhood with low quality infrastructure, without access to improved sanitation and clean water.

finding a job was about 85.8%, on average, and average perceptions about government responsibility were 66.6%.

Applicants in the information treatment group received four letters at most, 266 students received at least one letter, while 25 students did not receive any letters due to dropping out at the beginning of training or missing classes. On average, students received 2.2 letters while on training.

Finally, taking into account of the population of interest, which is NEET youth, we compared socio-demographic characteristics of NEET youths from LFS 2013 with our PEP participants. According to LFS 2013, 154, 997 youths aged between 15 and 30 were classified as NEET and this is 21.6% of the total population of the same age group. Socio demographic characteristics of NEET youths were quite similar to the characteristics of PEP participants (see Table 4).

4.4.2. Balance

When randomization is successful, baseline characteristics should be balanced between treatment and control groups. Columns 1-4 in Table 4 show comparisons of the characteristics between these two groups. Table 4 shows that treatment and control group characteristics were very similar for almost all main socio-demographic variables. There were no significant differences except for one variable: ambition on a scale of 100.

In Table 5, we present baseline characteristics for (i) participants assigned to training only, (ii) participants assigned to the information treatment (treatment 2) and (iii) participants in the control group. As can be seen, there were imbalances between treatment 1, treatment 2 and control groups. This could be due to the difference in randomization design choices between the treatments (columns 1-3)

As mentioned earlier, randomization of treatment 2 was implemented at a class level while randomization of treatment 1 was implemented at the individual level.

Although some variables were unbalanced between groups, the differences were very small and negligible, except for work experience. Therefore, we controlled for work experience in order to increase precision.

Imbalances may also have been due to the fact that randomization for treatment 2 was only possible for participants who showed up for training, and we had a high rate of no-shows. In Table 7, we checked the balance between treatment 2 and its control group (training only). We found some differences in terms of gender, monthly salary, job contract and perceived importance of one's own responsibility for finding a job, as well as indicators of classes and institutions.

V. Estimations

In this section, we discuss our estimators of the program's effects. Under full compliance, the difference in an outcome variable between treatment and control groups is the average treatment effect of the training program (ATE), and it can be interpreted as the average treatment on the treated (ATT) in the population.

Due to the presence of no-shows and dropouts in our intervention, we are able to identify an intention to treat (ITT) effect. By estimating ITT, we can evaluate the impact of offering the program. We estimate the following regression models:

$$Y_i = \beta_0 + \beta_1 \text{AssignedToTraining} + \delta X_i + \varepsilon_i \quad (1)$$

Where Y_i denotes our outcome variables, such as employment, earnings or formality and *AssignedToTraining* takes the value 1 for the treatment group (assigned to training, or training plus the information treatment) and 0 for the control group.

The estimator of β_1 in this equation indicates the effect of offering the program on an outcome variable as an ITT effect. According to Alzua et al. (2015), this coefficient is a relevant parameter for policy; it measures how much impact the program would have if the policy-makers offered it.

X_i is a vector of individual covariates, such as gender, marital status, schooling years, number of children under the age of 1, income other than monthly wage, and work experience from the baseline survey. In addition to these demographic variables, we add

ambition in the labor market and contract type, which were not balanced in the baseline, plus quarter dummies¹⁴.

We cluster standard errors by location¹⁵ and ger area within the district in estimations for employment, monthly earnings and skills match. This is because, given the geographical feature of UB city, individuals face different local labor market conditions depending on where they live. These differences can be captured by location and ger area variables in our database.

We need to estimate the effects of receiving a treatment, which is the treatment on the treated (TOT). In our case, a large number of participants did not show up for the training when assigned. As participants decide whether to take up the program or not when the program is available, receiving the treatment or not becomes an endogenous variable. In order to solve self-selection issues, we use random assignment as an instrument.

To estimate TOT effects, we create a dummy variable “trained”, which takes the value of 1 if the individual receives training, regardless of assignment, and 0 otherwise. For this variable, the random assignment is a valid instrument, since it is unrelated to the outcome variables, but strongly related to whether a participant receives training. F tests for the regression between “trained” and random assignment reject the null hypothesis in all cases.

We also estimate the effect of training using a difference-in-differences (DID) estimator to control for time in-variant unobservable. We conduct pooled OLS and panel estimations with both random and fixed effects.

5.1. First treatment results: employment, wages and job quality

Based on the first and second follow-up data, we analyze ITT and TOT effects of the VTP in the short and medium-terms. We are interested in the impact of the program on

¹⁴ Due to the on-going registration process of the VTP, the participants applied for training between August 2013 and March 2014. Therefore, we tracked and followed them between June and October 2014 for the first follow-up and June and October 2015 for the second follow-up. So, the registration process continued for 2 subsequent seasons and so do the follow-up surveys. In order to control for seasonal effects, we add variables for the 3rd and 4th quarter of 2013 and the 1st quarter of 2014.

¹⁵ Khorroos, close to the city center, have better access to drinking water, the central sanitation system, public transportation and public service, while khorroos, in suburban areas, have poorer access. Hence, we introduced a location variable indicating whether a khoroo is close to city center, or not.

employment, earnings and formality. Table 7 shows results for employment, labor force participation, monthly and hourly wages, weekly working hours, labor contract, social benefits paid by the employer and skill match.

We define employment as having a permanent job as of the week prior to the follow-up survey interview. On the other hand, labor force participation is defined as being employed or being unemployed but looking for a job as of the week prior to the interview. We asked those who were employed about their salary for the last month and working hours in the last week. The hourly wage rate is calculated based on monthly salary and weekly working hours. Monthly wage and hourly wage are coded as 0 for unemployed participants.

In order to identify job formality, Alzua et al. (2015), used administrative data in their follow-up data collection to define the percentage of participants who were employed in the formal sector.

In our case, we are able to define a number of indicators from the questionnaire to detect job formality since we asked participants several questions to determine whether they worked in the formal sector or not. We choose two variables for job quality: formality based on whether social security was paid by the employer, or not and skill match. The latter is a dummy variable for whether the participant's current position is related to his/her skills or not.

During our first follow-up survey, 49% of participants in the treatment group were employed: a positive difference of 3 pp with respect with the control group, although it is not significant.

Participants in the treatment group earned higher monthly salaries than participants in the control group by 20% on average, although the difference is not significant. We did not find a short-term significant difference in weekly working hours, in job formality or skill match either.

However, impacts appear quite mixed for the medium-term. We did not find a significant difference in employment rates between groups, although participants earned a salary 6.4 times higher than those in the control group.

Although we cannot detect any impact from simple comparisons, we found positive significant impacts on employment and monthly earnings when we controlled for some socio-economic demographic characteristics and unbalanced variables in the baseline.

In the following sections, we analyze treatment effects on variables of interest in detail.

5.1.1. Employment

Our main expected outcome from the training program was employment improvement through the improvement of skills based on employer demand. As shown in the previous section, estimated effects for the whole sample were positive but insignificant.

Tables 10 and 11 show ITT and TOT effects using control variables. As mentioned above, regressions include controls for gender, marital status, schooling years, work experience, number of children under 1, income other than monthly wage¹⁶, ambition in the labor market and a dummy variable for the type of training contract.

In panel A of Table 10, we report short-term ITT effects on employment. We found a 6 pp positive impact of offering the program, which suggests that VTP was successful in increasing employment for trainees, at least in this dimension. This treatment effect represents a 13% increase with respect to the control mean. Estimates for the TOT, shown in panel A of Table 11, show this effect scales up to 14 pp.

In the second columns of Tables 10 and 11, we show ITT and TOT estimates for the medium term. We did not find a significant impact in this case.

5.1.2. Monthly Earnings

From the first follow-up survey, average monthly earnings were 280, 721 Mongolian tugriks (\$137 US dollars) for the treatment group and 235, 056 Mongolian tugriks (\$115 US dollars) for the control group.

¹⁶ Income other than monthly wage is a dummy variable showing whether a participant has income sources other than monthly earnings, such as child benefit, pocket money from parents, remittances, unemployment benefit, or other types of social benefits, etc.

In panel B of Table 10, we show short and medium term ITT estimates of the impact on monthly earnings. We found that the VTP increases monthly earnings of trainees by 25%, in the short-term. This effect adds up to 64.6% in the TOT (see panel B of Table 11).

In the medium term, the effect of VTP on monthly earnings is still positive and significant: 16% in ITT, and 40% in TOT.

5.1.3. Job Quality

Like other developing countries, Mongolia is characterized by a large informal sector, where hiring and firing costs are low and jobs require low skills, long hours and do not provide any social benefits.

Schneider (2002) estimated the average size of informal economy in developing countries to be equal to 41% of GNI. According to Morris (2002), the informal sector employment share in Ulaanbaatar was 26.9% in 2000, and two thirds of informal sector workers were between 20 and 40 years old.

Table 7 shows the difference in means between treatment and control groups, which were not significant. In panel D of Table 10, we present ITT estimations for formality outcomes controlling for gender, age, education, housing type, marital status, real estate ownership, household income, income other than monthly wage and some variables featuring the work place before the treatment.

Since we asked participants about their previous work experience, we could also control for the type of job (employee, self-employed, employed without wage), the size of employer they worked for, whether the previous employer paid for their social security, and if they had paid benefits in addition to a monthly wage.

We found a significant and positive impact on formality using OLS. However, OLS estimations tend to be biased and inconsistent given the sample mean of formality which is close to zero.

Another interesting dimension of job quality is a skill match. This variable tells whether the participant's current job is related to his/her acquired skills. ITT effects on skill match are shown in panel C of Table 10. We found positive and significant ITT effects of

skill match in short term; the VTP increases the skill match by 4 pp, with a TOT of 13 pp. These differences disappear in the medium-term.

5.1.4. Panel Estimation

We also estimate the effect of training using a difference-in-differences estimator to control for time in-variant unobservable. In particular, we conduct pooled OLS and panel estimations with both random and fixed effects. Both estimations of DID on employment were significant and positive in the short-term (3 pp), while they were negative in the medium-term (1 pp).

Fixed effect estimations of the impact on employment were very small (negative) and insignificant. We did not find significant differences on monthly earnings, formality or skill match from panel estimations either.

5.2. Discussion

We could not detect any impact from simple mean comparison tests. However, we found positive significant impacts on outcome variables when we controlled for some socio-economic and demographic characteristics, and unbalanced variables of the baseline. In particular, we detected statistically significant short-term positive effects of the program on employment, wage and skill match from our ITT and TOT estimations. Table 10 presents F-statistics of ITT estimations, and Table 11 presents F-statistics of TOT estimations. All estimation results provide F-statistics larger than 10 (in the range of 23.5 and 114), indicating that the instruments are strong.

In order to control for a self-selection bias due to large no-shows, we conducted TOT estimations. Table 11 presents the estimation results. In TOT estimations, treatment effects are larger than the effects of ITT estimations, which implies a negative bias.

Quadrilateral contracts increased bureaucracy and the waiting period for the participants. According to randomization, 53.3% of treatment group had to have a quadrilateral contract. However, 70% of no-shows had to have quadrilateral contract whilst 39% of trained participants had to have this type of contract. According to the data, the trainees who applied for vocations with a quadrilateral contract had to wait 3 more days.

Moreover, 32.8% of no-shows with this contract requirement found a job after they applied for the program, while 21.9% of no-shows with a trilateral contract requirement found a job. These facts indicate that less skilled applicants may be more patient with waiting and more tolerant to bureaucracy. In this case, we expect self-selection to cause a negative bias, which is consistent with the above estimation results.

Based on our estimation results, we were able to do some cost-benefit analyses following Maitra and Mani's (2013) approach. According to MED, the program's total cost is \$100 US dollars per person. Average duration of participation in the training program is one month for an average program participant. If we assume that a trainee would lose a chance to earn the mean monthly salary of the control group, then the opportunity cost is \$164 US dollars. Moreover, the trainer will incur a transport cost of 10\$. Hence, the total cost per trainee will be \$274 US dollars. According to ITT effects, the impact on monthly earnings is \$32 US dollars in the short term and \$25 US dollars in the medium term. Hence, the total cost of the program on the student will be recovered within 10 months, or less than a year of continued employment. In Maitra and Mani (2013), the program was cost effective as the total cost was recovered within less than 4 years of continued employment. We conclude that the vocational training program in UB is cost effective.

5.3. Second treatment results: attendance and dropouts

One of the distinctive features of this study is a randomized information treatment (the second treatment) for trainees.

According to MED, about 20% of participants in the VTP drop out on average. This high dropout rate may be related to the lack of information about labor market outcomes of skilled labor.

Jensen (2010) showed that perceived returns, which may affect schooling decisions, were inaccurate and extremely low, and that information on the higher measured return to secondary school increased schooling by 0.20-0.35 years. Hence, information about measured labor market outcomes of skilled people may influence attendance directly and thus, the impact of VTP.

In this section, we analyze the impacts of the information treatment on trainees' attendance and dropout. We define dropout as a dummy for whether participants dropped out without completing training. Moreover, attendance is measured by the total number of days a participant attended training.

We measure the intent-to-treat (ITT) effect of information treatment on an outcome of interest by estimating the following equation:

$$Y_i = \alpha + \beta \text{AssignedToInformation} + \beta X_i + \varepsilon_i \quad (2)$$

Where Y_i denotes outcome variables such as attendance and dropout and *AssignedToInformation* takes value 1 for the information treatment group, and zero for the control group (trained only). The estimate of β_1 in this regression equation indicates the effect of providing information for trainees on an outcome variable, as an ITT effect.

X_i is a vector of individual characteristics, such as age, marital status, years of education, gender, housing condition, number of children and childcare.

According to Galdo and Chong (2012), trainees attending high-quality training courses had higher earnings and better jobs than trainees attending low quality courses or non-participants, and expenditure per trainee was the most important characteristic. We measure training quality with building ownership, large class (larger than institutional average) and minimum cost per student. We define a class as large if class size was larger than the institutional average.

Table 8 reports results for these two outcome variables. Overall drop-outs in our sample were low, less than 10%. We define and estimate a probit model for this. Columns (2) and (3) show significant impacts of the second treatment on dropout, the ITT being 5.1%. In other words, delivering a letter with general information about labor market outcomes of skilled labor reduces dropout by 5.1% at the mean. We did not find any heterogeneous impacts by gender, age groups or housing condition.

On the other hand, column (1) shows a significant impact of the second treatment on attendance, the ITT for attendance being 3.3 days. This effect is economically significant; the treatment group attended 13.8% more days than the control group. We did not find any heterogeneous effects.

VI. Policy recommendations

During our experimental study, we closely cooperated with the Metropolitan Employment Department (MED), the primary implementing agency of the VTP.

At the early stages of the project, we discovered two problems related to youth enrollment in the program by observing data from all applicants plus a monitoring report on the flow of applicants and trainees.

First, although the program explicitly prioritized youth under 25 years of age, they represented only 22% of the pool of applicants. Secondly, their take up rate was extremely low in comparison with other age groups (around 10%). We sent a weekly report on this to MED and organized a meeting with public officers to present these findings. They suggested that the main reason behind this low take up rate had to do with the contract requirement.

The quadrilateral contract requirement (between participants, a district and a MED officer, plus the employer) was introduced in 2013 in order to improve job quality, but it had been difficult to meet by the unemployed youth, who did not have a well-built network in the job market.

Recognizing the problem, MED immediately started to target the youth and unemployed in order to increase their participation and sought to make it easier for applicants to find private firms with whom to sign the contract through coordination with labor exchange units. Eventually, in 2014, they decided to go back to the trilateral contract.

After our impact evaluation and based on our findings, we can provide the following policy recommendations for the Ministry of Labor, EPSC and MED.

In order to increase the take up rate, other actions beyond the contract reform may be considered, such as removing slot quotas by vocation, since some vocations are more in demand than others by young applicants.

Moreover, it may be worth strengthening the screening procedure for eligibility status, in order to improve the focus of the program. Current eligibility status does not exclude some people with a relatively moderate livelihood. For example, some university students and women were in the program either as a hobby, or to improve their housework

skills. Although these cases do not represent a large share, these inefficiencies and their cost influence should not be underestimated.

MoL and MED may also incorporate follow-up procedures in their internal monitoring and evaluation reports. In particular, following up youth who graduate from the program for at least 2 years afterwards may be important to evaluate the impacts on their employment, job quality and earnings. We found no significant impact on job formality and long-term employment, but regular and thorough follow-up studies could provide some useful information to improve the program's impact on these key outcomes.

Recently, a longer-term vocational training (2 to 5 months) was implemented in order to increase impact of VTP. However, the impact may depend more on design than on duration. More specific policy recommendations may arise from a cost-benefit analysis.

VII. Final remarks

Mongolia is a lower-middle income country characterized by very high youth unemployment. In the beginning of the 2000s, the government started implementing vocational training programs following the typical OECD format to tackle this issue.

However, the Mongolian design for VTPs is different in the sense that training is shorter-term and thus less expensive than in other countries, in particular, Latin American countries.

In order to evaluate the impact of this program, we conducted a field experiment between 2013 and 2015. This period allowed us to examine short and medium term impacts.

We estimated the impact of VTP on employment, earnings and job quality. We found the vocational training program had a positive and short-term impact on employment, but the impact disappears in the medium-term. In particular, VTP successfully increased the employment rate by 13% in the short-term.

On the other hand, we identified positive impacts of the program on monthly earnings in both the short and long term. In particular, the VTP effectively increased trainees' monthly earnings by 25% in the short-term, and by 16% in the medium-term.

We measured job quality with two variables: formality and skill match. We did not find a significant impact on formality. However, VTP increased skill match by 4 pp in the short-term.

As for heterogeneous effects, we did not find any economically significant differences in outcome variables by gender, age group, or ger area.

In the second stage of our study, the randomized information treatment, we found positive effects of providing information about labor market outcomes of skilled workers on trainee attendance. In particular, attendance increased by 3.3 days, while dropout decreased by 5 pp. Hence, this may be a non-expensive way to improve the overall impact of training.

According to the estimation results, the program participant will recover the cost within less than a year. Hence, the program is cost effective as it recovers the total cost within a considerably short time period.

Finally, we must mention that a problem of external validity, one of the most common with RCT studies, also presented us with a challenge. Although the scale of the program was not big enough and the rate of non-compliance was high, we can say that the program can be extrapolated. This conclusion is based on the following grounds. Firstly, there was a similarity in socio-demographic characteristics between the total NEET youths (LFS 2013) and the PEP participants (see Table 4). Second, we did not find any economically significant heterogeneity across gender, dwelling type or age group. Finally, first stage estimates of TOT estimation indicated that the treatment variable is very strong instrument.

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Tables and figures

TABLE 1. REASONS FOR NO-SHOW

	No.Obs	Percent
Personal reasons	121	35.1
Got a job	102	29.6
VTP related reasons	107	31.0
Other	15	4.3
Total	345	100

TABLE 2. CLASSIFICATION OF TREATMENT GROUPS

	Control	Vocational training treatment*	of which	
			Trained with information	Trained without information**
Number of Participants	414	774	291	141

*344 participants from the treatment group did not show up.

** Out of 141, 22 participants were not randomized at the second treatment.

TABLE 3. RANDOMIZATION OF THE SECOND TREATMENT

	Randomization of the second treatment		
	Total	Treatment	Control
Total class	141	101	40
Total student	410	291	119
Male	137	112	25
Female	273	179	94

TABLE 4. COMPARISON OF SOCIO-DEMOGRAPHIC CHARACTERISTIC OF NEET YOUTHS AND EXPERIMENT SAMPLE

	NEET youth	Experiment sample
Average age	24	23
Female	63.2	64.9
Household size	4.4	4
Higher educated	50.9	28.8
Married	34.7	32.1

TABLE 5. BASELINE BALANCE AND ATTRITIONS

Summary Statistics: Mean, Differences and p-value												
Variables	Baseline Balance				Attrition: Follow-up 1				Attrition: Follow-up 2			
	Treatment	Control	Diff	p-value	Missing	Observed	Diff	p-value	Missing	Observed	Diff	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Age	22.98	22.94	0.03	0.87	22.33	22.96	-0.63	0.21	22.45	23.00	-0.55	0.10
Female	0.65	0.65	0.00	0.93	0.57	0.67	-0.10	0.14	0.54	0.68	-0.14	0.00
Ger area	0.82	0.83	0.00	0.93	0.64	0.83	-0.19	0.00	0.72	0.84	-0.12	0.00
Household size	4.00	4.10	-0.10	0.30	3.49	4.06	-0.57	0.01	3.98	4.04	-0.05	0.71
Married	0.31	0.34	-0.03	0.36	0.22	0.33	-0.11	0.11	0.20	0.34	-0.13	0.00
Education in years	10.78	10.79	-0.02	0.93	10.88	10.78	0.10	0.81	10.49	10.82	-0.33	0.22
Previous work experience	0.61	0.62	-0.01	0.85	0.50	0.62	-0.12	0.08	0.53	0.63	-0.09	0.04
Work experience in months	22.07	20.50	1.58	0.38	16.02	21.81	-5.79	0.16	17.69	22.02	-4.33	0.11
Monthly salary							-				-	
	274,139	272,553	1,586	0.94	268,240	273,861	5,621	0.91	235,719	278,195	42,476	0.21
Job contract	0.27	0.30	-0.04	0.23	0.16	0.28	-0.12	0.07	0.18	0.29	-0.11	0.01
Social security	0.20	0.23	-0.03	0.19	0.18	0.21	-0.03	0.64	0.13	0.22	-0.09	0.02
Past experience on training	0.20	0.22	-0.02	0.52	0.26	0.21	0.05	0.36	0.14	0.22	-0.08	0.05
Planned days to attend training	33.97	35.44	-1.47	0.11	31.63	34.59	-2.96	0.15	32.70	34.67	-1.96	0.16
Plan to complete training	0.94	0.96	-0.02	0.18	0.90	0.95	-0.05	0.14	0.91	0.95	0	0.04
Ambition to succeed in LM /scale of 100/	90.19	92.31	-2.11	0.04	96.10	90.66	5.44	0.02	90.29	90.97	-0.69	0.66
Ambition to succeed in LM in level	1.13	1.10	0.03	0.16	1.10	1.12	-0.02	0.71	1.12	1.12	0.00	0.92
Importance of own responsibility to get a job	66.57	66.70	-0.13	0.94	63.88	66.74	-2.87	0.48	65.26	66.78	-1.52	0.57
Perception of government responsibility to get a job	85.67	86.12	-0.44	0.74	92.35	85.52	6.82	0.02	90.80	85.23	5.57	0.01
Contract type	0.47	0.24	0.23	0.00	0.53	0.39	0.14	0.04	0.41	0.39	0.02	0.67
Hotelling's T-squared	73.29				28.48				19.94			

TABLE 6. BASELINE BALANCE BY TREATMENT 1, TREATMENT 2 AND CONTROL

Summary Statistics: Mean, Differences and p-value					
Variables	Baseline				
	Treatment 1 (T1)	Treatment 2 (T2)	Control (C)	T1 vs. C P-value	T1 and T2 vs. C P-value†
	(1)	(2)	(3)	(4)	(5)
Age	22.69	23.45	22.94	0.29	0.02
Female	0.67	0.62	0.65	0.46	0.29
Ger area	0.85	0.78	0.83	0.42	0.10
Household size	4.02	3.96	4.10	0.47	0.52
Married	0.29	0.36	0.34	0.10	0.11
Education in years	10.58	11.10	10.79	0.29	0.04
Previous work experience	0.57	0.68	0.62	0.16	0.01
Work experience in months	19.99	25.54	20.50	0.79	0.02
Monthly salary	242,767	326,763	272,553	0.20	0.01
Job contract	0.26	0.28	0.30	0.15	0.35
Social security	0.18	0.23	0.23	0.06	0.13
Past experience on training	0.19	0.23	0.22	0.26	0.36
Planned days to attend training	33.83	34.20	35.44	0.11	0.25
Plan to complete training	0.94	0.94	0.96	0.23	0.41
Ambition to succeed in LM /scale of 100/	89.34	91.61	92.31	0.01	0.02
Ambition to succeed in LM in level	1.16	1.09	1.10	0.04	0.03
Importance of own responsibility to get a job	69.19	62.24	66.70	0.19	0.00
Perception of government responsibility to get a job	83.87	88.66	86.12	0.14	0.01
Contract type	0.35	0.66	0.24	0.00	0.00

† Oneway analysis p-value between treatment 1, treatment 2 and control groups

TABLE 7. FOLLOW-UP SUMMARY STATISTICS

Summary Statistics: Mean, Difference and p-value										
Outcome Variables	Follow-up 1					Follow-up 2				
	Treatment	Control	Difference	p-value	No obs	Treatment	Control	Difference	p-value	No obs
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Employment	0.49	0.46	0.03	0.36	1075	0.52	0.56	-0.03	0.34	1003
Labor force participation	0.58	0.59	-0.02	0.62	1075	0.62	0.63	-0.01	0.87	1003
Monthly earnings	280,721	235,056	45,665	0.12	1070	329,926	310,000	19,926	0.51	993
Hourly wage	5,572	4,606	967	0.16	1063	6,752	5,847	905	0.51	989
Weekly working hours	28.29	26.87	1.42	0.50	1074	31.32	34.15	-2.83	0.22	1000
Job contract	0.23	0.22	0.01	0.60	1075	0.28	0.33	-0.05	0.14	1003
Social security	0.18	0.17	0.01	0.56	1075	0.23	0.27	-0.04	0.17	1003
Skill match	0.26	0.21	0.04	0.12	1073	0.28	0.25	0.02	0.45	1002
Formality	0.17	0.15	0.02	0.47	1075	0.22	0.26	-0.04	0.15	1003

TABLE 8. IMPACTS OF TREATMENT 2 ON OUTCOME VARIABLES

	Attendance	Drop-out	
Dependent	OLS	OLS	Margins
	(1)	(2)	(3)
Treatment 2	3.35** (1.66)	-0.08** (0.04)	-0.05** (0.03)
Control group mean	23.64	23.64	23.64

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Notes: Regressions include controls for gender, age, age square, marital status, ger area dummy, ambition in labor market, schooling years, number of children under 1, class size, own building, expenditure per student in log and childcare.

TABLE 9. ESTIMATIONS: TAKE-UP RATE

Variables	OLS (1)	Probit: Margins (2)
Age	0.00 (0.01)	0.00 (0.01)
Female	-0.04 (0.05)	-0.05 (0.06)
Ger area	0.00 (0.05)	0.01 (0.06)
Household size	0.00 (0.01)	0.00 (0.02)
Married	0.03 (0.04)	0.04 (0.05)
Education in years	0.02** (0.01)	0.02** (0.01)
Previous work experience	0.09* (0.05)	0.11* (0.06)
Work experience in months	0.00 (0.00)	0.00 (0.00)
Monthly salary	-0.00** (0.00)	-0.00* (0.00)
Contract type	0.34*** (0.04)	0.36*** (0.04)
Past experience on training	0.00 (0.05)	-0.00 (0.05)
Planned days to attend training	-0.00 (0.00)	-0.00 (0.00)
Plan to complete training	0.08 (0.09)	0.09 (0.11)
Expectation on getting a job /scale of 100/	-0.00 (0.00)	-0.00 (0.00)
Ambition to succeed in the labor market /scale of 100/	0.00** (0.00)	0.00** (0.00)
Importance of own responsibility to get a job	-0.00* (0.00)	-0.00* (0.00)
Perception about government responsibility to get a job	0.00** (0.00)	0.00** (0.00)
Constant	-0.43* (0.26)	
Observations	622	622
R-squared	0.198	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 10. ITT EFFECTS OF TRAINING ON LABOR MARKET OUTCOMES

Dependent Variable	OLS		Probit	
	Short run	Long run	Short run	Long run
	t=1 (1)	t=2 (2)	t=1 (3)	t=2 (4)
Panel A: Employment				
Treatment group - ITT	0.06** (0.02)	-0.00 (0.04)	0.06* (0.03)	-0.00 (0.04)
F-statistics	114.0	110.1		
Control group mean	0.46	0.56	0.46	0.56
Panel B: Monthly Earnings				
Treatment group - ITT	59,086.56** (21,750.19)	50,265.98** (20,251.23)		
F-statistics	71.7	75.1		
Control group mean	235,056	310,000		
Panel C: Skill Match				
Treatment group - ITT	0.01 (0.08)	-0.05 (0.04)	-0.01 (0.08)	-0.05 (0.04)
F-statistics	52.9	49.9		
Control group mean	0.21	0.25	0.21	0.25
Panel D: Social Security				
Treatment group - ITT	0.04** (0.02)	-0.01 (0.03)	0.01 (0.01)	-0.00 (0.03)
F-statistics	32.4	23.5		
Control group mean	0.17	0.27	0.17	0.27

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Regressions for employment, wage and skill match include controls for gender, age, age square, marital status, ger area dummy, number of children under 1, vocational or higher education dummy, schooling years, income other than wage, ambition in labor market, contract type and seasonal dummies. Regressions for social security include controls for age, age square, ger area dummy, gender, ownership of real estate, household income, income other than wage, schooling years, marital status, wage job, small sized enterprise, social security from baseline and taking a benefit.

TABLE 11. TOT EFFECTS OF TRAINING ON LABOR MARKET OUTCOMES

Dependent Variable	2SLS		2SLS with Probit	
	Short run t=1 (1)	Long run t=2 (2)	Short run t=1 (3)	Long run t=2 (4)
Panel A: Employment				
Treatment group - TOT	0.14** (0.06)	-0.01 (0.10)	0.14** (0.02)	-0.01 (0.93)
Control group mean	0.46	0.56	0.46	0.56
Panel B: Monthly Earnings				
Treatment group - TOT	151,953.90** (59,833.72)	126,808.21** (52,443.66)		
Control group mean	235,056	310,000		
Panel C: Skill Match				
Treatment group - TOT	0.14** (0.05)	0.10 (0.07)	0.13*** (0.05)	0.11 (0.08)
Control group mean	0.21	0.25	0.21	0.25
Panel E: Estimation Results of First Stage				
Randomization	0.39*** (0.02)	0.40*** (0.03)		
Constant	-0.28 (0.62)	-0.33 (0.63)		
Observations	1,048	979		
F-statistics of the First-Stage Regressions	36.71	36.56		
R-squared	0.12	0.12		

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: First-stage estimation is controlled by the same covariates used in the second stage.