working paper
2019-11

# Demand-Driven Youth Training Programs: Experimental Evidence from Mongolia

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May 2019

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policy analysis on growth and employment

# Demand-Driven Youth Training Programs: Experimental Evidence from Mongolia


## Abstract

Because of its high incidence and potential threat to social cohesion, youth unemployment is a global concern. This study uses a randomized controlled trial to analyze the effectiveness of a demand-driven vocational training program for disadvantaged youth in Mongolia. Mongolia, a transitional country whose economic structure shifted from a communist, centrally planned economy to a free-market economy over a relatively short period, offers a new setting in which to test the effectiveness of standard active labor market policies. This study reports positive and statistically significant short-term effects of vocational training on monthly earnings, skills matching, and self-employment. Substantial heterogeneity emerges as relatively older, richer, and better-educated individuals drive these positive effects. A second intervention that randomly assigns participants to receive repetitive weekly newsletters with information on market returns to vocational training shows positive impacts on the length of exposure to and successful completion of the program. These positive effects, however, are only observed at the intensive margin and do not lead to higher employment or earnings outcomes.



**Keywords**: vocational training programs, labor market, randomized controlled trial, employment, earnings, job quality.
**JEL**: J18, J08, J24, J38, C93



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## Acknowledgements

This work was carried out with financial and scientific support from the Partnership for Economic Policy (PEP) and 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 Centre (IDRC). The views and opinions expressed in this publication are those of the authors and do not necessarily reflect those of PEP. This study is registered at the AEA RCT with reference number AEARCTR-0002461.

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# I. Introduction

Youth unemployment is an ubiquitous problem in most developed and developing countries. Over seventy-three million youth aged 15-24 are unemployed worldwide, and around 20 percent of the world's youth are neither employed nor enrolled in an education or training program (ILO, 2017). The labor-market conditions of disadvantaged youth are even more dramatic because they disproportionately lack skills and access to decent jobs that could lift them out of poverty (ILO, 2015). In Mongolia, the setting of our study, youth unemployment reached 23 percent in 2017, while the share of young individuals who were neither employed nor enrolled in an education or training program topped 25 percent (Shatz et al., 2015). Such a situation entails a massive waste of economic resources and is a threat to social cohesion.

In this paper, we assess the effectiveness of an Active Labor Market Program (ALMP) that targets poor and unemployed youth in Ulaanbaatar, the capital of Mongolia. The aim of the program is to improve the overall employability of young participants through a combination of in-class vocational skills training and on-the-job training. Although vocational skills training is the most widely used ALMP for disadvantaged youth worldwide (Betcherman et al., 2007), there is no evidence regarding its effectiveness in central Asia. The most recent meta-analyses (Card et al., 2018 and Kluve et al., 2019) reveal this important gap in the literature.

The large body of evidence presented and discussed in recent systematic reviews of ALMPs (e.g., Kluve et al., 2019), makes clear that contextual reality matters in measuring the magnitude and statistical relevance of labor-market outcomes. Mongolia is a new setting for an assessment of ALMPs because it is a "transitional country"—that is, one whose labor market was rapidly transformed from a centrally planned to a free-market economy. In fact, Mongolia's economy shifted from a centralized, communist system, in which youth unemployment was officially very low or nonexistent, to a free-market economy with one of the highest rates of youth unemployment in the world. Assessing whether vocational-skills training would foster employment and wage growth for young, vulnerable, and unemployed individuals in such an environment is relevant to policy.

The Mongolian vocational skills-training program is a so-called "demand-driven" ALMP, which combines in-class training in selected vocational skills with on-the-job training in the form of paid internships (see, e.g., Galdo, Jaramillo and Montalva, 2008 and Ibarrarán and Rosas, 2009). In the mid-nineties, following structural economic reforms similar to those seen in Mongolia, demand-driven programs became widely used in several Latin American countries, and assessments of their effectiveness showed positive effects on employment and earnings, particularly for disadvantaged women (Betcherman et al., 2007). Under this approach, private institutions offer training courses in occupations in which labor demand exists. Whether such a market-based training scheme would work in a transitional economy such as Mongolia's remains an important question.

From a methodological standpoint, we implemented a market-based program design following a standard randomized-control-trial (RCT) approach, which allowed us to identify, under weak conditions, causal treatment effects on employment and earnings. In fact, this is the first ALMP in central Asia to employ an experimental counterfactual design. Although RCTs have long been used in the U.S. in programs such as the National Supported Work Demonstration and the Job Training Partnership Act, experimental evidence from developing countries remains limited, although studies in the past decade have increased, particularly in Latin America and Africa.[1]

One important source of variation in the magnitude of treatment effects for training programs is lack of compliance with the treatment design (Heckman et al., 2000). Disadvantaged individuals are commonly unable to complete training programs because of personal or institutional barriers or because they lack information/knowledge regarding the returns to training. No matter the specific source of this empirical regularity, the effectiveness of training programs depends upon the length of exposure to the intervention as shown in Galdo et al. (2012) and Choe, Flores-Lagunes, and Lee (2015). This finding points toward policy choices that would increase training exposure for potential dropouts.

Because lack of knowledge about market returns to training in a setting in transition from Communism to a market-based economy could lead participants to make uninformed

[1] See Attanasio, Kegler, and Meghir (2011), Card et al. (2011), and Ibarrarán et al. (2015) for Latin America; and Blattman et al. (2014) and Cho et al. (2013) for Africa.

choices, we used a second randomization design within the group of participants to distribute, on a random basis, personalized weekly newsletters with information about the returns to vocational training in Mongolia. While the importance of providing information about market returns has been shown to be effective in other developing settings such as school classrooms (Jensen, 2010), to the best of our knowledge it has not been tested as a policy design in the context of an ALMP in a developing or transitional country.

Our results show positive and statistically significant short-term wage gains for the average participant. These wage gains hold one year after the training. We also observe positive and statistically significant effects in self-employment and skills matching along with small but not significant effects for salary work. Important heterogeneities in the results emerge as relatively older, more educated and less poor individuals benefit more from this intervention. Unlike recent training interventions in developed (Card, Kluve and Weber, 2010 and Card et al., 2018) and developing settings (Attanasio, Kugler and Meghir, 2011; Alzúa, Cruces and Lopez, 2016, Díaz and Rosas, 2016), we find no differential treatment effects by gender. Finally, provision of weekly newsletters to trainees with information on market returns for vocational training in Mongolia led to significant gains in the length of exposure to the program and lower dropout rates. These positive results do not, however, translate into higher employment or earnings.

This paper is organized as follows. Section 2 describes briefly the Mongolian labor market, while section 3 provides details about the training design institutions. Section 4 develops the evaluation experimental design as section 5 discusses the data and baseline covariate distribution for treatment groups. Section 6 presents the results while section 7 provides some concluding remarks.

## II. Institutional Setting

Mongolia is a small, transitional country with a population of slightly above three million. It is a landlocked area located between Russia and China (Figure 1). Ethnic Mongols account for about 95 percent of the population, and the most common language, spoken by most of the population, is Mongolian. Mongolia is one of the least densely populated countries in the world, with almost half its population living in the city of Ulaanbaatar, the country's capital. Mongolia's population is relatively young: 42 percent of its people were younger than 24 in 2018. Following the dismantling of the USSR in the early 1990s, Mongolia's economy changed dramatically from a centrally planned system to a market-based one, and Soviet assistance, which had accounted for almost one third of Mongolia's GDP, disappeared almost overnight.

Today, Mongolia has a per capita GDP of $13,000 USD (PPP), which makes its economy comparable to that of South Africa or Sri Lanka. Because Mongolia is resource-rich, with large deposits of copper, gold, coal, and uranium, its mining sector accounts for almost one fifth of GDP and 40 percent of exports. This sector has transformed Mongolia in a few decades from a traditional agricultural- and herding-based economy to a resource-based economy. Agriculture nonetheless remains the largest employer in the country and absorbs 30 percent of the labor force

Before the transition, the Mongolian labor market was characterized by high labor-force participation that reached more than 75 percent in the early 1990s. According to official statistics, unemployment was nonexistent because of the "everyone should work" policy, and the youth-unemployment rate was reported as close to zero. Only after 1992 did Mongolia begin measuring and reporting unemployment rates. Economic reforms implemented in the 1990s and afterward, including privatization and price liberalization, led to structural changes in Mongolia's economy: labor-force participation began to fall while unemployment rates increased dramatically. Indeed, youth unemployment reached 23 percent in 2017, almost twice the global rate (13 percent). Moreover, the share of inactive youth aged 15-29 who are not in education, employment, or training (NEET) has remained consistently above 20 percent since the early 2000s (Shatz et al., 2015). The NEET rate is

disproportionately higher for young women relative to men and for urban households relative to rural ones.

## III. The Mongolian Vocational Training Program

The Mongolian Vocational Training Program (VTP) was introduced in 2003 in an effort to counteract high levels of youth unemployment. The primary goal of the Mongolian VTP was to help unemployed people get jobs through a combination of vocational skills training and internships in private firms, and it remains the oldest and most extensive labor-market policy in effect in the country. The Mongolian VTP follows key aspects of standard demand-driven training approaches skills training is aligned to the real needs of local employers.

The rationale for demand-driven programs is twofold. Firstly, they aim to de-centralize the traditional supply of vocational training by public institutions in favor of a market of private institutions that can offer relevant, up-to-date training. Established private firms therefore usually bid to offer training. Secondly, they aim to train beneficiaries in vocations that the market demands by combining traditional classroom education with on-the-job training in the form of internships, and the private suppliers of training courses connect participants with internships.

The Employment Promotion Service Center (EPSC) of the Mongolian Ministry of Labor is the public entity responsible for the overall design and implementation of the training program, including the selection of training institutions and participants. The VTP is financed by the State Employment Promotion Fund which targets youth aged 15-30 who are poor, unemployed, or vulnerable to unemployment. According to administrative data from the Ministry of Labor, the total number of participants by 2011 was 8,000 and the total program expenditure was approximately 3.5 billion MNT, equivalent to $2.1 million USD. The EPSC selects training institutions through a competitive bidding process. The selection criteria for training institutions include evidence of ability to provide adequate training, legal registration, curriculum quality, teaching quality, adequacy of training sites, and,

importantly, the ability to place trainees in internship positions with registered private employers.

Although the Mongolian VTP started in 2003, its effectiveness has never been assessed. This paper focus on the 2013 call that purposely used a randomized controlled trial to identify and measure its impact. In that year, the Metropolitan Employment Department (MED) selected 47 training institutions in Ulaanbaatar that offered 141 courses in some eighty different vocational skills, including construction, hairdressing, cooking, and heavy-machinery operation. The length of training varied from twenty to forty-five days, depending upon vocation, with a minimum duration of 144 hours per course. According to the program's regulations, traditional classroom teaching did not exceed 30 percent of total hours, and practical, on-the-job training and internships accounted for the rest. Compared to other vocational training programs in developing countries (see, e.g., McKenzie, 2017), the Mongolian VTP was shorter and, thus, less expensive. The tuition fee was set between 140,000 MNT and 220,000 MNT per participant in 2013 (approximately USD $90-$140). The program offered no additional benefits such as transportation, meals, or insurance. Due to budgetary constraints, the official number of training slots was originally set to 1,400 in 2013.

Prospective trainees aged 15-30 were assessed at their local district office. After completing a short baseline questionnaire, each applicant was screened for eligibility by an administrative officer. All suitable applicants were sent to a district labor office in which each applicant, alongside a labor officer, chose chooses her preferred vocational-skills course in a given institution on a first-come-first-served basis. To secure participation, eligible individuals signed an agreement with the corresponding labor office. Up until the Spring of 2013, participants were required to sign a "trilateral" contract that involved an EPSC district officer, a MED officer, and the beneficiary. Thus, it was solely the responsibility of training institutions to obtain internships for trainees. Subsequently, the EPSC changed to a "quadrilateral" agreement that added prospective employers as a fourth signatory. In practice, this meant that both trainees and training centers were, by agreement, equally in charge of securing internships. As Section 5 shows, this institutional change created an important slowdown in registration and enrollment, which in turn affected no-shows.

## IV. Evaluation Design

The RCT design was implemented during registration by allocating eligible trainees randomly to treatment and control groups. Registration took place between August 26th and November 22th, 2013. Each day during that period, the flow of eligible applicants was randomly assigned to either the treatment or control groups based on a 2:1 rule. As a result, the treatment group was made up of 774 trainees (65.2 percent), and 414 (34.8 percent) were assigned to the control group for a total of 1,188 participants.[2]

Individuals in the treatment group were distributed across 141 courses at 47 seven training centers. Class size varied highly across training courses and ranged from three to 30 participants. The average number of MED-funded students was 9.6 per class. Actual class sizes may have been slightly larger, however, because training institutions were entitled to recruit privately funded students if maximum class size was not reached. Though this happened occasionally, the significance was marginal and most courses maintained small class sizes.

We incorporated a second, independent random allocation scheme as part of the evaluation design to evaluate whether providing information to trainees about market returns to training affected participation and length of exposure to the program. Administrative data showed that dropout rates were particularly high for the Mongolian VTP. Because there is no evidence regarding the labor-market effects of this ALMP, it could be argued that the average participant might not be fully aware of the labor-market benefits of completing this training initiative. This information constraint is even more important in the context of Mongolia's very rapid transition from a state-controlled to a market-based economy. Inspired by Jensen (2010), we added an information feature to our evaluation framework that consisted of randomly assigning participants to receive weekly newsletters that contained information on market returns to vocational training.

In the context of formal schooling in the Dominican Republic, Jensen (2010) showed that students tended to underestimate the returns to formal schooling. When they were

[2] We originally set the sample size to 2100 individuals corresponding to 1400 in the treatment group and 700 in the control group to be able to detect a three percentage-point increase in employment with a power of 80 percent and a dropout rate of 30 percent. Unfortunately, and due to budget's revisions, the Mongolian government slashed the number of potential beneficiaries for the 2013 call.

correctly informed, however, both enrollment in the subsequent year and the average length of formal schooling increased. In the context of vocational training programs, Galdo et al. (2012) and Choe, Flores-Lagunes, and Lee (2015) showed for Peru and South Korea, respectively, that failure of participants to complete training programs negatively affects the returns to training.

We thus randomly assigned weekly newsletters to training-program participants. This allocation of newsletters was implemented at the class level, rather than at an individual level, to prevent spillover effects. The treatment itself consisted of the delivery of weekly newsletters, with comparative information about labor market outcomes of skilled and unskilled workers in Mongolia, to each student in selected classes. The newsletters clearly stated market wages for occupations in sectors that were similar to those of the trainees and compared wages for jobs filled by unskilled workers. Appendix Table 1A shows a typical newsletter submitted to students. We randomly assigned 101 classes to the treatment newsletter group and 40 classes to the control group.

## V. Data, Balancing Tests, and Take-Up Assessment

Our empirical framework is based on individual-level survey data, including a baseline collected in the fall of 2013 and two follow-up surveys administered six and twelve months after training. Figure 2 illustrates the timeline of the intervention and data collection. The evaluation data includes sociodemographic variables, participation in formal schooling and training, labor-market outcomes, and detailed information on participation in the Mongolian VTP. With respect to the original sample, data attrition reached 5.4 percent at baseline, 9.6 percent at the first follow-up survey, and 15 percent at the second follow-up survey as shown in Appendix Table 2A. Although attrition seems to be non-random, it is relatively low and affect both treatment and control groups evenly.[3] This survey data is

[3] Appendix Table 3A shows the mean differences test for attrition status for the first and second follow-up surveys. Results show that attrition is correlated with gender, household size, the presence of children, dwelling type, income per capita below poverty line, marital status, and work experience. We use these variables as control covariates in the computation of treatment effects.

complemented by administrative data available from 46 out of 47 institutions that offered training programs and included variables such as the number of instructors per classroom, average class size, expenditure per student, and instructor salaries. These variables are used to explore the relationship between the quality of the training centers and the magnitude of treatment effects.

Table 1 shows the mean covariate balancing test for two experimental designs, one for the allocation of training slots (left panel) and one for the allocation of weekly newsletters to individuals who received treatment (right panel). Baseline data show that the typical applicant is twenty-three years old, female (65 percent), and poor (83 percent lived in *Gers).* Almost half of the participants are married (46 percent), have children (42 percent), and live with their parents (47 percent). On average, they show high levels of formal schooling (80 percent have at least completed high school) and prior labor experience (60 percent). The p-values for the coefficients of OLS models that regress treatment status on baseline covariates (left panel) are above 0.10 in all cases, indicating that individuals in the treatment and control groups came from the same population.

For the newsletter-treatment group, on the other hand, the right panel in Table 1 shows that the p-values for most variables do not reject the equality of means between experimentally determined treatment groups. We reject this equality with regard to a few variables, however—mainly those related to chosen vocations. This is expected because random allocation of VTP participants to the newsletter-treatment group occurred at the course rather than at the individual level.

Because administrative data revealed lack of full compliance with the treatment, it was important to assess the determinants of take-up of the VTP in order to understand potential implications for the assessment of treatment effects. Out of the 766 applicants randomly assigned to receive vocational-skills training, 327 (42 percent) did not show up for training. Appendix Table 4A gives detailed information on enrollment numbers. Self-reported survey information indicated that, among those who did not receive the treatment, 35 percent cited family and personal commitments (e.g., household chores or pregnancy), 30 percent had started a new job right after enrollment, and 31 percent said they were not able to comply with the requirements (i.e., trilateral vs. quadrilateral) of the VTP contract.

From a policy standpoint, then, empirical assessment of the determinants of take-up becomes essential in order to gain insight both into the operation of the program (e.g., targeting, eligibility rules, institutional requirements) and into the identification and estimation of the parameters of interest.

Table 2 shows the results from linear probability models in which the dependent variable takes the value of 1 for those treatment-group individuals who received the treatment and 0 for those who did not. We used a rich set of independent baseline covariates, including standard sociodemographic and labor-market variables, prior labor-market outcomes, VTP institutional variables, and self-reported expectations regarding training and performance in the labor market. Our results indicate that a handful of sociodemographic variables were statistically correlated with take-up decisions. On average, gender, household wealth, age, and formal schooling were important to take-up rates because women and individuals who were wealthier, older, and better-educated were more likely to participate in the program relative to men, poorer, younger, and less well-educated individuals. Importantly, we found no meaningful statistical relationship between take-up and labor-market variables at baseline. This pattern ran counter to observations in other labor market programs in which variables related to labor markets emerged as the main determinants of take-up.

Moreover, institutional variables related to the operation of the Mongolian VTP emerge as important take-up predictors. Individuals who are required to present quadrilateral contracts, for example, were fifty-four percentage points less likely to take-up the treatment relative to individuals asked to present trilateral contracts. This institutional requirement constituted a critical barrier for take-up. Likewise, the likelihood of attending the training is statistically related to the vocational-skills courses chosen. Individuals who initially selected courses related to hairdressing and craftsmanship are less likely to attend training (-20 percentage points), while individuals who selected mechanical- and machinery-related courses are more likely to participate (+18 percentage points).

Table 2 also shows that take-up decisions were associated with self-reported expectations regarding training, labor-markets, and the role of government in facilitating jobs for youth. Individuals who felt optimistic about getting a job or those who believed

that the government should play a major role in helping youth find jobs took up the treatment disproportionately. On the other hand, individuals who self-report a high probability of getting a job in the next months or individuals who believe that getting a job is primarily a personal responsibility are less likely to take-up the treatment.

Overall, as shown by the p-values of joint significance at the bottom of Table 2, sociodemographic and institutional variables (contractual agreements) are the most important predictors of take-up rates, while prior labor market outcomes are not statistically associated to take-up decisions.

## VI. Empirical Framework and Findings

As a result of the lack of compliance with the random allocation to treatment, we follow the standard approach described in the literature and considered the estimation of two parameters of interest: intent-to-treat (ITT) and effective treatment-on-the-treated (TOT). The estimate of the intent-to-treat parameter is based on a standard, multivariate linear regression function of the form:

$$Y_i = \alpha + \beta Z_i + X_i'\gamma + \tau i + \epsilon_i \qquad (1)$$

where $Y_i$ is the outcome of interest for individual $i$, $Z_i$ is the treatment indicator (1 for those offered treatment and 0 otherwise). $X_i$ are individual- and household-level baseline control variables, and $\epsilon_i$ is the error term[4]. Because we have as many experimental groups as the number of days the random allocation lasted, Equation 1 also includes fixed-effects by day of random assignment, $\tau_i$.

The effective treatment-on-the-treated (TOT) parameter, on the other hand, is estimated by 2SLS estimator following an instrumental variable approach in which actual participation in the training program (T) is instrumented by treatment status (Z):

[4] Control variables included gender, age, schooling, poverty index, district of residence, type of dwelling, marital status, subjective expectations related to likelihood of getting a job, ambition to succeed in the labor market, self-reliance in job-seeking, and government's responsibility to provide a job.

$$\begin{cases} Y_i = \alpha + \beta T_i + X_i'\gamma + \tau i + \epsilon_i \\ T_i = \delta Z_i + X_i'\gamma + \tau i + \varepsilon_i \end{cases} \quad (2)$$

Appendix Table 5A shows the first-stage estimation results. The coefficient associated with the instrumental variable Z is statistically significant at the 1% level, and the resulting F-statistic is 24, which indicates the relevance and strength of the instrument.

Table 3 presents the main results for four outcomes of interest (employment, monthly earnings, skills matching, and self-employment) at six and twelve months following training. Both robust standard errors (in parenthesis) and clustered standard errors by date of random assignment (in brackets) are reported. The upper panel shows short-term (six-month) treatment effects, while the lower panel shows the medium-term (twelve-month) mean effects.

Short-term effects are presented in Table 3. The point estimates make clear that the average gain of offering the training is positive and statistically significant for monthly earnings, skills matching, and self-employment. The magnitude of the effects for monthly earnings is relatively large (as high as 23%) from a mean of the control group of approximately $100 USD. In addition, we found statistically significant effects equivalent to six percentage points for the skills-matching outcome, indicating that the vocational skills of participants are better aligned to occupations with respect to those of individuals in the control group.

We additionally observe statistically significant effects on self-employment equal to 3.5 percentage points. Self-employment double among VTP participants relative to non-participants, although its incidence remained very low in comparison to what is commonly observed in other developing countries. Finally, we observe positive (5.5 percentage points) but imprecisely measured ITT effects for the employment variable. Regarding TOT estimates in the second row, the magnitude of the effect increases as expected: monthly earnings for those who received the treatment increases in more than 50 percent relative to the mean of the control group, while the average gain for skills matching and self-employment reaches 14 and 8 percentage points. The employment variable shows a sizable mean impact of 12 percentage points, although it is imprecisely measured.

The lower panel in Table 3 shows mean effects twelve months after completion of

training. For monthly earnings and self-employment, the point estimates for both ITT and TOT parameters quite in line with short-term findings, and positive and statistically significant effects emerge. Likewise, we observe positive gains for the employment outcome but lack statistical precision. On the other hand, the effects on skills matching dissipates and become statistically not significant one year later. This result indicates that, in the medium-term, the training initiative fell short of achieving one of its promises: matching occupations and vocational skills for youth.

## Heterogeneous Effects

To account for the heterogeneity of effects across subgroups of participants, we follow the same estimation framework for ITT and TOT parameters given in Equations 1 and 2 after interacting the treatment status variable with the covariates of interest: gender (men vs. women), age (15-21 vs. 22-30), poverty status (poorest vs. less poor), and educational attainment (less than high school vs. high school or tertiary education). These policy variables, commonly used in the assessment of vocational training programs worldwide, are related to the efficiency of the targeting approach. As before, we use the same four outcomes of interest at six (Table 4A) and twelve months (Table 4B) after the intervention.

The results highlight the large heterogeneity of vocational-training effects across demographic groups. Table 4A reports that individuals aged 21, normally the demographic group at the highest risk of unemployment, benefit least from the program six months after treatment. According to TOT point estimates at six months after training, the likelihood of employment, self-employment, and skills matching is, respectively, 27, 17, and 17 percentage points lower for the youngest group relative to the 22-30-year-old cohort. Twelve months after the intervention, however, these differences are no longer statistically significant. This suggests a rapid deterioration of VTP effects over time for all age groups rather than an improvement in labor market outcomes for the youngest vs. the older cohorts. Consistent (negative) differential effects for monthly earnings also emerged for the youngest group six months after the intervention; at twelve months, the point estimates become significant only at the 10% level. Because lack of compliance with the requirements

of demand-driven design (e.g., firms' internships contracts) was disproportionately higher among participants younger than 22, these results seem to suggest that a different approach to targeting and efficiency may be needed for this cohort. Interestingly, the second panel of Tables 4A and 4B show that men and women benefit equally across all outcomes of interest. This important result is contrary to what has been observed in similar demand-driven approaches in other countries, particularly in Latin America, as shown by Attanasio, Kugler and Meghir (2011) for Colombia; Card et al. (2011) and Ibarrarán et al. (2015) for the Dominican Republic; Alzúa, Cruces & Lopez, 2016 for Argentina; and Díaz and Rosas (2016) for Perú. All these studies showed that young women benefited more from this type of vocational training initiatives than did young men.

While the Mongolian VTP was originally designed to target youth from poor households, Tables 4A and 4B also show that people in the bottom quartile of the household asset index benefit less from the program. In comparing those at the bottom of the poverty index to those at the middle and upper end of the distribution, the TOT parameters show statistically significant differential coefficients for employment (-37 percentage points), skills matching (-23 percentage points), and self-employment (-17 percentage points). These sizable differences in treatment effects hold 12 months later, although the employment and skills-matching outcomes lack statistical significance. Monthly earnings for the poorest among the poor, on the other hand, show negative differential effects at six and twelve months after the intervention, although these effects are measured with statistical precision only at the twelve-month period.

Finally, sizable heterogeneous effects emerge on the basis of participants' formal level of schooling. Individuals with less than a high-school education and those who had completed high school show negative differential effects in comparison to participants with tertiary or some college education. These differences are monotonic with respect to education level. In particular, the magnitude of these differential effects is striking for those at the bottom of the schooling ladder and for two outcomes of interest: employment and monthly earnings. The TOT point estimates at six and twelve months after the intervention show the likelihood of employment is 74 percentage points lower for individuals with the least amount of formal schooling in comparison to those at the upper end of the schooling

distribution. For monthly earnings, the sizable negative magnitude of the coefficients holds over time.

## Effect by Field of Training

Knowing whether mean effects vary according to field of study could be important for policy because it may signal the importance of providing training participants with training in certain fields rather than in others. Table 5 provides intent-to-treat point estimates according to field of study. Rather than consider only one treatment indicator, we included multiple treatment variables in Equation 1 according to field of study. Each of these treatment indicators takes the value of 1 if it refers to the specific "X" field of study and is 0 otherwise. We considered the following categories: mechanical/machinery, hairdressing and beauty services, craftsmanship, agriculture and gardening, cooking and baking, and other services, which together accounted for 90 percent of training courses. These point estimates should be taken as merely indicative and assessed with caution, however, because sorting or self-selection of trainees into specific fields of study may be driven by unobserved factors (e.g., personal traits) which are, in turn, correlated with the outcomes of interest in Equation 1.

Our results indicate impact heterogeneity for the Mongolian VTP according to chosen field of study in the short run, although most of the parameters lack statistical significance. "Mechanical/machinery" and "hairdressing and beauty services" show positive and significant effects, with the latter showing the largest effects across all outcomes of interest six months after the intervention. Consistently, the p-values of the F-test for the equality of parameters of interest across all fields of study are lower than 0.10 for three out of four outcomes of interest in the short run. These heterogeneous differences by field of study tend to dissipate across all fields of study at twelve months following treatment, however. Still, we observe that "hairdressing and beauty services" is the only field of study that shows positive and significant mean gains for the self-employment outcome twelve months after the intervention, while "agriculture and gardening" and "craftsmanship" show negative differential effects for earnings and self-employment outcomes.

All in all, there is some weak but suggestive evidence that indicates impact heterogeneity according to chosen field of study. These differences are observed mainly in the short run for particular fields of study and dissipated one year after treatment.

## Newsletter Treatment

Participants who attended training courses received repetitive weekly newsletters with information about wage returns to vocational training. The newsletters were randomly allocated at the class level in order to minimize treatment contamination among peers. Out of the 410 trainees who attended 141 training courses, 291 were assigned to the newsletter treatment group (101 courses) and 119 to the information control group (40 courses). Not all 291 individuals received the newsletters because some of them did not show up in the training centers. However, we focus on the estimation of ITT treatment effects without any formal distinction between ITT and TOT parameters because the rate of no-shows was relatively low for the information treatment. We asses five different outcomes of interest: days attended VTP, whether completed VTP, whether received VTP qualification (passed the exam), whether received VTP certificate (formal graduation from program), and dropout rates. Because there was variation in the length of the courses, we assess the impact of the newsletter treatment at the extensive (whether participants received the newsletter) and intensive (number of newsletters participants received) margins.

The upper panel of Table 6 shows the results at the extensive margin. All variables show the expected signs although none of them is measured with statistical precision. In terms of magnitude of effects, some variables such as "received VTP qualification" (16 percentage points) and "received VTP vocational qualification" show sizable effects, although they lack statistical significance. At the intensive margin, however, the lower panel shows statistically significant effects for all outcomes of interest. On average, each additional newsletter is associated with 2.3 additional days of attendance, a higher probability of completing the course (6.9 percentage points), a higher probability of passing the qualification exam (8.5 percentage points), a higher probability of receiving a formal graduation certificate (5 percentage points), and a lower probability of dropping out (-7.7

percentage points). These results suggest that repetition of the message matters, a finding that is in line with the relatively recent stream of literature in development economics that provides analysis and insight regarding RCT interventions that use repetitive SMS messages to improve economic outcomes (e.g., health practices) in developing settings (e.g., Chong, 2011).

Unlike the impact of vocational training, which was of benefit to relatively better-off young participants, the newsletter-related intervention show no statistical differences in average gains across demographic groups. Table 7 illustrates the extensive (Panel A) and intensive (Panel B) margins at which we observe no statistically significant heterogeneous effects by age, gender, level of schooling, or poverty status.

A related policy question is whether the combination of vocational training with the distribution of targeted information about market returns to training leads to higher wages and employment. To test this idea, we add an interaction term between the VTP treatment status in Equation 1 with the newsletter treatment. Table 8 shows the point estimates for the interaction terms along with standard errors. We do not observe statistically meaningful results because the estimated coefficients for the interaction terms are imprecisely measured across all outcomes of interest at six and twelve months after the intervention. Thus, although the newsletter treatment is effective in extending the length of exposure to the vocational skills training program (at the intensive margin), this does not translate into an improvement in the labor market outcomes of those who received the information vs. those who did not.

## VII. Conclusion

This study analyses the effectiveness of a demand-driven vocational training program in Ulaanbaatar, the capital of Mongolia. The setting of this study is new to the literature because little is known about Mongolia's labor markets in light of its relatively recent transition from a centrally planned economy, wherein unemployment was set to zero by law, to a market economy. Like other demand-driven vocational training programs

implemented since the 1990s, the Mongolian VTP aimed to counteract high levels of youth unemployment by responding to actual labor market needs through a mix of traditional classroom courses and on-the-job training (internships).

Our evaluation framework followed a randomized-control-trial approach that identified average treatment effects under weak conditions. We implemented two independent random allocation developments: the first measured the labor market effects of vocational training vs. no training at all, and the second measured the role of information about market returns to training on the length of exposure to training. To the best of our knowledge, this is the first labor-market RCT implemented in central Asia.

One striking result that emerged from this study was the low take-up rate for the intervention. Around 42% of individuals randomly assigned to training did not attend the courses. Analysis of the determinants of take-up showed that institutional constraints, notably the requirement that quadrilateral contracts be signed prior to the start of the course, as well as chosen field of study and some demographic variables (gender, education) played an important role in take-up. In particular, the quadrilateral-contract requirement, which is at the core of demand-driven approaches, seemed to be the major barrier to participation in training programs, and its role cannot be understated.

Overall, we observed positive average effects of the training intervention on monthly earnings, skills matching, and self-employment. Positive results were mainly observed in the short run, however, though statistically significant effects on monthly earnings and self-employment persisted at twelve months. As in the case of other ALMPs implemented worldwide, we also observed that not everyone benefited equally from the program, which highlights the importance of policies that concern the targeting of participants and the design of training content. In fact, substantial heterogeneous effects emerged because relatively better-off, older, and better-educated students benefitted disproportionately from the intervention. Such results indicate that the Mongolian VTP failed to help those most in need. On the other hand, and unlike most demand-driven training programs, particularly those implemented in Latin America, the Mongolian did not benefit young women more than it did young men. This result held at six and months after the intervention.

Because length of exposure to training is related to the overall efficiency of the intervention, we randomly assigned students to receive weekly newsletters that contained information on market returns to vocational training in order to evaluate the impact of that information on variables related to the successful completion of training. In line with a new stream of literature on digital technologies (SMS messages) and economic outcomes in developing settings, which highlight the role of framing and message repetition, we found that providing information to young participants had positive impacts on the length of exposure to training and on the successful completion of training at the intensive margin. These positive results did not, however, lead to higher earnings or employment rates.

# References


Alzúa, M. L., Cruces, G., and Lopez, C. (2016). Long-Run Effects of Youth Training Programs: Experimental Evidence from Argentina. Economic Inquiry 54, 1839-1859.

Angrist, J. and Pischke, J.-S. (2009). Mostly Harmless Econometrics: An Empiricist's Companion (Economics Books). New Jersey: Princeton University Press.

Attanasio, O., Kugler, A., and Meghir, C. (2011). Subsidizing Vocational Training for Disadvantaged Youth in Colombia: Evidence from a Randomized Trial. American Economic Journal: Applied Economics 3, 188-220.

Blattman C., Fiala N., Martinez S. (2014). Generating Skilled Self-employment in

Developing Countries: Experimental Evidence from Uganda. The Quarterly Journal of Economics. 697–752.

Betcherman, G., Godfrey M., Puerto, S., Rother F., Stavreska, A. (2007). A Review of

Interventions to Support Young Workers: Findings of the Youth Employment Inventory. Social Protection Discussion Paper Series, No. 715. The World Bank.

Card, D., Ibarrarán, P., Regalia, F., Rosas-Shady, D., and Soares, Y. (2011). The Labor Market Impacts of Youth Training in the Dominican Republic. *Journal of Labor Economics 29,* 267-300.

Card, D., Kluve, J., and Weber, A. (2010). Active Labour Market Policy Evaluations: A Meta-Analysis. *The Economic Journal 120*, F452-F477.

Card, D., Kluve, J., and Weber, A. (2018). What Works? A Meta-Analysis of Recent Active Labor Market Program Evaluations. *Journal of the European Economic Association 16*, 894-931.

Choe, C., Flores-Lagunes, A., and Lee, S.-J. (2015). Do Dropouts with Longer Training Exposure Benefit from Training Programs? Korean Evidence Employing Methods for Continuous Treatments. *Empirical Economics 48*, 849-881.

Chong, Alberto. (2011). Development Connections. Unveiling the Impact of New Information Technologies. Palgrave McMillan.

Díaz, J. J. and Rosas, D. (2016, April). Impact Evaluation of the Job Youth Training Program. Inter-American Development Bank Working Paper Series No. IDP-WP-693.

Galdo, José and Chong, A. (2012). Does the Quality of Public-Sponsored Training Programs Matter? Evidence from Bidding Processes Data. *Labour Economics 19*, 970-986.

Galdo, José, Jaramillo, M., and Montalva, V. S. (2008). Household Wealth and Heterogeneous Impacts of a Market-Based Training Program: The Case of Projoven in Peru (SSRN Scholarly Paper No. ID 1265796). Rochester, NY: Social Science Research Network.

Heckman, J., Hohmann, N., Smith, J., and Khoo, M. (2000). Substitution and Dropout Bias in Social Experiments: A Study of an Influential Social Experiment. *The Quarterly Journal of Economics 115*, 651-694.

Ibarrarán, P., Kluve, J., Ripani, L., and Rosas, D. (2015, November). Experimental Evidence

on the Long-term Impacts of a Youth Training Program. Inter-American Development Bank Labor Markets Unit, IDB Working Paper Series No. IDB-WP-657.

Ibarrarán, P. and Shady, D. R. (2009). Evaluating the Impact of Job Training Programmes in Latin America: Evidence from IDB funded operations. *Journal of Development Effectiveness 1*, 195-216.

International Labour Office (ILO). (2017) Global Employment Trends for Youth 2017. Path to a Better Working Future. Geneva.

International Labour Office (ILO). (2015) Youth and informality promoting formal employment among youth: Innovative experiences in Latin America and the Caribbean (Lima, Regional Office for Latin America and the Caribbean).

Jensen, R. (2010). The (Perceived) Returns to Education and the Demand for Schooling. *Quarterly Journal of Economics 125*, 515-548.

Kluve, J., Puerto, S., Robalino, D., Romero, J. M., Rother, F., Stöterau, J., Weidenkaff, F., and Witte, M. (2019). Do Youth Employment Programs Improve Labor Market Outcomes? A Quantitative Review. *World Development 114*, 237-253. doi: https://doi.org/10.1016/j.worlddev.2018.10.004.

Kluve, J., Puerto, S., Robalino, D., Romero, J. M., Rother, F., Stöterau, J., Weidenkaff, F., and Witte, M. (2016, October). Do Youth Employment Programs Improve Labor Market Outcomes? A Systematic Review. IZA Institute of Labor Economics, IZA Research Network Discussion Paper No. 10263. Available from http://ftp.iza.org/dp10263.pdf.

McKenzie, D. (2017). How Effective Are Active Labor Market Policies in Developing Countries? A Critical Review of Recent Evidence. Policy Research Working Paper No. WPS 8011, Impact Evaluation Series. Washington, DC: World Bank Group. Available from http://documents.worldbank.org/curated/en/256001490191438119/How-effective-are-active-labor-market-policies-in-developing-countries-a-critical-review-of-recent-evidence.

Shatz, H. J., Constant, L., Perez-Arce, F., Robinson, E., Beckman, R. L., Huang, H. C., Glick, P., and Ghosh-Dastidar, B. (2015). *Improving the Mongolian Labor Market and Enhancing Opportunities for Youth*. Santa Monica, CA: RAND Corporation. Available from https://www.rand.org/pubs/research_reports/RR1092.html.

# Appendices

**Figure 1: Mongolia**

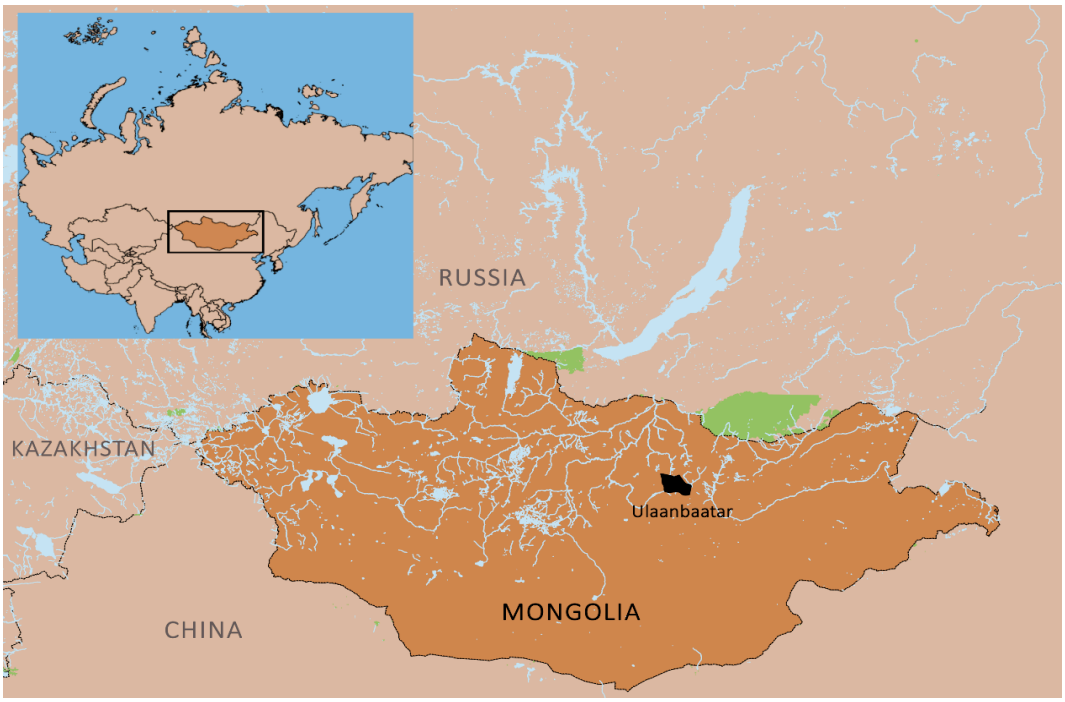


Figure 2: Timeline of the VT Intervention
Mongolian VT, 2014-2016

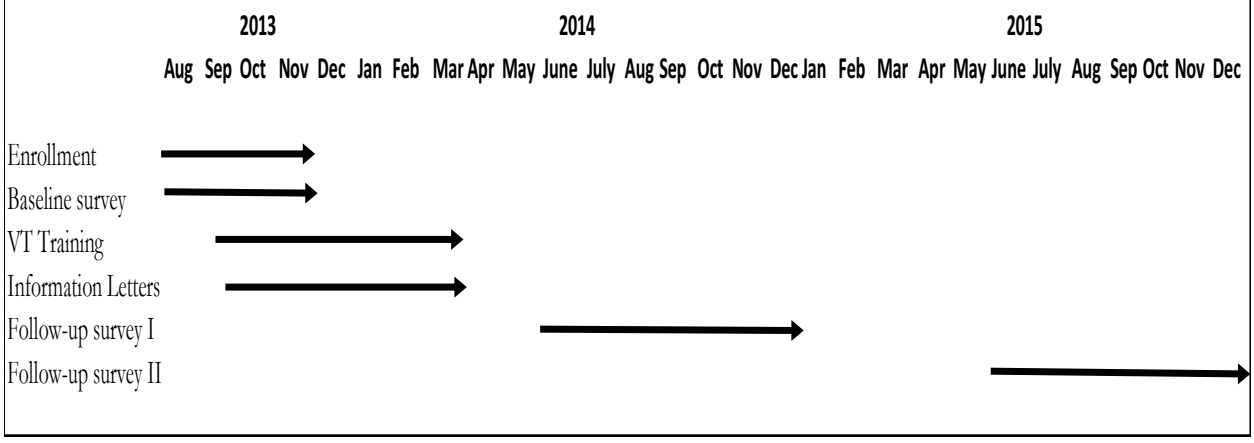

**Table 1: Balancing Test Across Experimental Groups**
**Mongolian VT, 2014-2016**

| | Treatment I: Vocational Training (VT) | | | Treatment II: Information Letters | | |
|---|---|---|---|---|---|---|
| **Socio-Demographics** | Treated | Control | p-value | Treated w/ Letter | Treated w/o Letter | p-value |
| gender (1=males) | 0.35 | 0.35 | 0.99 | 0.38 | 0.21 | 0.53 |
| age | 22.97 | 22.94 | 0.76 | 23.43 | 23.46 | 0.73 |
| marital status (1=married) | 0.45 | 0.47 | 0.44 | 0.49 | 0.51 | 0.99 |
| residence (1=Ger) | 0.82 | 0.82 | 0.85 | 0.78 | 0.78 | 0.47 |
| less than high school | 0.19 | 0.20 | 0.78 | 0.13 | 0.15 | 0.58 |
| high school | 0.51 | 0.50 | 0.51 | 0.58 | 0.51 | 0.23 |
| technical education | 0.08 | 0.11 | 0.17 | 0.07 | 0.11 | 0.32 |
| college + | 0.21 | 0.19 | 0.67 | 0.22 | 0.24 | 0.76 |
| household size | 3.99 | 4.09 | 0.25 | 3.96 | 3.98 | 0.20 |
| has children | 0.41 | 0.42 | 0.34 | 0.44 | 0.45 | 0.33 |
| live with parents | 0.48 | 0.46 | 0.81 | 0.47 | 0.43 | 0.86 |
| parents have work | 0.29 | 0.27 | 0.63 | 0.30 | 0.26 | 0.93 |
| has disability | 0.05 | 0.05 | 0.98 | 0.06 | 0.05 | 0.74 |
| poverty index | -0.00 | 0.01 | 0.87 | 0.18 | 0.21 | 0.80 |
| **Labor Market and Income** | | | | | | |
| has work experience | 0.61 | 0.62 | 0.68 | 0.68 | 0.68 | 0.25 |
| # weeks of work experience | 4.88 | 4.58 | 0.69 | 4.03 | 0.00 | 0.17 |
| previous vocational training | 0.20 | 0.22 | 0.50 | 0.23 | 0.27 | 0.09 |
| out of LF (child care duties) | 0.25 | 0.29 | 0.28 | 0.24 | 0.32 | 0.78 |
| out of LF (student) | 0.10 | 0.09 | 0.54 | 0.06 | 0.10 | 0.19 |
| out of LF (homemaker) | 0.06 | 0.07 | 0.44 | 0.04 | 0.05 | 0.79 |
| no monthly income | 0.54 | 0.55 | 0.90 | 0.49 | 0.48 | 0.86 |
| has income from remittances | 0.06 | 0.06 | 0.79 | 0.06 | 0.09 | 0.94 |
| has labor market income | 0.15 | 0.12 | 0.13 | 0.16 | 0.12 | 0.87 |
| receive welfare income | 0.14 | 0.17 | 0.25 | 0.18 | 0.21 | 0.56 |
| **Expectations** | | | | | | |
| subjective prob of getting a job | 0.78 | 0.80 | 0.28 | 0.77 | 0.80 | 0.31 |
| optimistic to get a job | 0.67 | 0.70 | 0.46 | 0.71 | 0.75 | 0.85 |
| ambition to succeed in labor market | 0.88 | 0.91 | 0.22 | 0.91 | 0.95 | 0.31 |
| personal responsibility to get a job | 0.66 | 0.66 | 0.94 | 0.62 | 0.69 | 0.02 |
| government responsibility to provide a job | 0.85 | 0.86 | 0.92 | 0.88 | 0.90 | 0.94 |
| plan to complete VT | 0.94 | 0.96 | 0.45 | 0.94 | 0.95 | 0.39 |
| number of days plan to attend VT | 34 | 35 | 0.19 | 34 | 34 | 0.93 |
| **Elegibility** | | | | | | |
| eligible to VT due to unemployment status | 0.85 | 0.84 | 0.58 | 0.83 | 0.88 | 0.10 |
| employment as main reason to join VT | 0.78 | 0.81 | 0.21 | 0.77 | 0.79 | 0.77 |
| applied to cooking/baking VT courses | 0.12 | 0.12 | 0.96 | 0.13 | 0.08 | 0.00 |
| applied to beauty/hairdressing VT courses | 0.23 | 0.26 | 0.57 | 0.25 | 0.26 | 0.45 |
| applied to mechanical/machinery VT courses | 0.26 | 0.23 | 0.31 | 0.28 | 0.11 | 0.11 |
| applied to craftmanship VT courses | 0.17 | 0.13 | 0.31 | 0.20 | 0.18 | 0.03 |
| applied to agriculture/gardening VT courses | 0.02 | 0.01 | 0.41 | 0.02 | 0.00 | 0.00 |

Note: p-values from OLS models of treatment status on each baseline covariate of interest. For Treatment I, we included a set of fixed-effects for day of random assignment. For Treatment II, we included training center fixed effects. Sample size varies across covariates and ranges from 1185 to 1118 for Treatment I and from 410 to 389 for Treatment II.

**Table 2: Determinants of Take-up for Vocational Training Program**
**Mongolian VT, 2014-2016**

| | coeff. | std. error | p-value |
|---|---|---|---|
| **Socio-Demographics** | | | |
| age 20-24 | **-0.095*** | 0.049 | 0.057 |
| age 25-30 | -0.022 | 0.058 | 0.698 |
| gender (1=males) | **-0.096*** | 0.051 | 0.058 |
| marital status (1=married) | 0.020 | 0.050 | 0.680 |
| residence (1=Ger) | -0.052 | 0.046 | 0.258 |
| less than high school | **-0.124**** | 0.058 | 0.034 |
| high school | 0.028 | 0.044 | 0.525 |
| technical education | 0.013 | 0.070 | 0.848 |
| household size | -0.017 | 0.012 | 0.154 |
| has children | 0.033 | 0.051 | 0.518 |
| live with parents | 0.060 | 0.054 | 0.268 |
| parents have work | 0.016 | 0.049 | 0.745 |
| has disability | 0.091 | 0.084 | 0.278 |
| poverty index | **0.031*** | 0.016 | 0.058 |
| **Labor Market and Income** | | | |
| has work experience | 0.051 | 0.039 | 0.187 |
| # weeks of work experience | -0.000 | 0.000 | 0.118 |
| previous vocational training | 0.016 | 0.041 | 0.702 |
| out of LF (child care duties) | -0.043 | 0.050 | 0.386 |
| out of LF (student) | 0.015 | 0.060 | 0.803 |
| out of LF (homemaker) | -0.033 | 0.073 | 0.655 |
| no monthly income | -0.016 | 0.057 | 0.774 |
| has income from remittances | 0.056 | 0.086 | 0.509 |
| has labor market income | 0.059 | 0.067 | 0.381 |
| has welfare income | 0.097 | 0.072 | 0.181 |
| **Expectations** | | | |
| subjective prob of getting a job | **-0.058**** | 0.022 | 0.008 |
| optimistic to get a job | **0.158***** | 0.048 | 0.001 |
| ambition to succeed in labor market | 0.037 | 0.055 | 0.499 |
| personal responsibility to get a job | **-0.038**** | 0.017 | 0.029 |
| government responsibility to provide a job | **0.067***** | 0.017 | 0.000 |
| plan to complete VT | -0.016 | 0.077 | 0.831 |
| number of days plan to attend VT | 0.001 | 0.001 | 0.413 |
| **VT Institutions** | | | |
| trilateral VT contracts | **0.545***** | 0.049 | 0.000 |
| ratio training slots/applicants | -0.000 | 0.001 | 0.870 |
| eligible to VT due to unemployment status | 0.022 | 0.048 | 0.639 |

…..continuation

| | coeff. | std. error | p-value |
|---|---|---|---|
| know about VT through medios | **0.126**** | 0.052 | 0.017 |
| know about VT through letter | -0.068 | 0.052 | 0.190 |
| know about VT through Internet | 0.083 | 0.071 | 0.244 |
| know about VT through local employment office | 0.063 | 0.041 | 0.132 |
| applied to cooking VT courses | -0.033 | 0.076 | 0.666 |
| applied to beauty/hairdressing VT courses | **-0.202***** | 0.073 | 0.006 |
| applied to mechanical/machinery VT courses | **0.184***** | 0.074 | 0.014 |
| applied to craftmanship VT courses | **-0.199***** | 0.075 | 0.009 |
| applied to agriculture/gardening VT courses | -0.038 | 0.076 | 0.710 |
| **N** | 702 | | |
| **$R^2$** | 0.32 | | |
| p-value of F-test for joint demographic variables=0 | | 0.000 | |
| p-value of F-test for joint labor market variables=0 | | 0.237 | |
| p-value of F-test for joint subjective expectations variables=0 | | 0.000 | |
| p-value of F-test for joint VT institutions variables=0 | | 0.000 | |

Notes: Linear probabilistic model on take-up for VT program. Dependent variable takes the value 1 for those treated units who attended program , 0 for the treated no-show units.

Table 3: Average Impacts on Labor-Market Outcomes, Mongolian VT Training Program

| | Short-term Impacts: 6 months later | | | |
|---|---|---|---|---|
| | Employment | Monthly earnings | Skills Match | Self-Employment |
| *ITT* | 0.055 | **56113** | **0.060** | **0.035** |
| | (0.035) | (31335) | (0.029)** | (0.020)* |
| | [0.046] | [29978]* | [0.031]* | [0.019]* |
| $R^2$ | 0.12 | 0.15 | 0.15 | 0.16 |
| *TOT* | **0.128** | **130798** | **0.141** | **0.083** |
| | (0.077)* | (69668)* | (0.065)** | (0.045)* |
| | [0.099] | [64699]** | [0.069]** | [0.043]* |
| $R^2$ | 0.12 | 0.14 | 0.15 | 0.15 |
| *mean control group* | 0.456 | 234397 | 0.212 | 0.072 |
| *N* | 1044 | 1044 | 1044 | 1044 |

| | Medium-term impacts: 12 months later | | | |
|---|---|---|---|---|
| | Employment | Monthly Earnings | Skills Match | Self-Employment |
| *ITT* | 0.011 | **62447** | 0.036 | **0.039** |
| | (0.035) | (31887)** | (0.031) | (0.021)* |
| | [0.038] | [34200]* | [0.038] | [0.017]** |
| $R^2$ | 0.17 | 0.19 | 0.16 | 0.15 |
| *TOT* | 0.027 | **145244** | 0.085 | **0.092** |
| | (0.077) | (70774)** | (0.070) | (0.047)** |
| | [0.084] | [76334]* | [0.087] | [0.039]** |
| $R^2$ | 0.17 | 0.17 | 0.15 | 0.14 |
| *mean control group* | 0.556 | 310000 | 0.254 | 0.071 |
| *N* | 975 | 975 | 975 | 975 |

Notes:Standard errors in parenthesis and clustered standard errors by date of random assignment in brackets. Intent-to-treat (ITT) parameters estimated by multivariate OLS models that use as control variables: gender, age, scholing, poverty index, district and place of residence (Ger), marital status, subjective job expectations related to likelihood of getting a job, ambition to succeed in labor markets, self-reliance to get a job, government responsibility to provide a job, and fixed-effects by date of random assignment. Tretment on the Treated (TOT) parameters estimated by 2SLS that instruments the treatment (T) by the randomly assigned treatment status (Z) of participants.

**Table 4A: Heterogenous Impacts for VT Training Program, 6 months**
**Mongolia Vocational Training, 2014-2016**

| | employment 6-month | | wages 6-month | | skills match 6-month | | self-employment 6-months | |
|---|---|---|---|---|---|---|---|---|
| | ITT | TOT | ITT | TOT | ITT | TOT | ITT | TOT |
| ***VT Program*** | 0.054 | 0.127 | 54518 | 128885* | 0.051 | 0.121 | 0.018 | 0.046 |
| | (0.056) | (0.121) | (34954) | (77709) | (0.043) | (0.093) | (0.024) | (0.052) |
| ***VT *Males*** | 0.002 | 0.001 | 4598 | 5172 | 0.027 | 0.052 | 0.049 | 0.100 |
| | (0.073) | (0.141) | (66492) | (133094) | (0.070) | (0.139) | (0.055) | (0.110) |
| ***VT Program*** | 0.104** | 0.214** | 68682* | 152084** | 0.092** | 0.197** | 0.046* | 0.197** |
| | (0.052) | (0.107) | (35467) | (71571) | (0.040) | (0.082) | (0.024) | (0.082) |
| ***VT * age 15 -21*** | **-0.140**** | **-0.266**** | -35618 | -65668 | **-0.091*** | **-0.172*** | -0.029 | **-0.172*** |
| | (0.062) | (0.114) | (41667) | (76576) | (0.049) | (0.091) | (0.031) | (0.091) |
| ***VT Program*** | 0.094** | 0.210** | 60939* | 138528** | 0.085*** | -0.192*** | 0.054** | 0.121** |
| | (0.045) | (0.094) | (32238) | (69893) | (0.032) | (0.072) | (0.023) | (0.048) |
| ***VT *poor*** | **-0.147*** | **-0.375*** | -16691 | -31850 | **-0.092*** | **-0.230*** | **-0.067*** | **-0.169*** |
| | ().084) | (0.211) | (56420) | (143213) | (0.053) | (0.140) | (0.039) | (0.095) |
| ***VT Program*** | 0.194** | 0.371** | 120131** | 236334** | 0.122** | 0.242** | 0.048 | 0.100 |
| | (0.079) | (0.157) | (56608) | (112403) | (0.066) | (0.120) | (0.040) | (0.074) |
| ***VT * less high school*** | **-0.255**** | **-0.540**** | **-160794*** | **-352399*** | **-0.184*** | **-0.425*** | -0.039 | -0.066 |
| | (0.105) | (0.266) | (86494) | (211118) | (0.099) | (0.237) | (0.066) | (0.159) |
| ***VT * high school*** | **-0.168**** | **-0.300**** | -58691 | -97297 | -0.045 | -0.068 | -0.009 | -0.014 |
| | (0.084) | (0.160) | (59114) | (111371) | (0.083) | (0.151) | (0.049) | (0.090) |
| $R^2$ | 0.12 | 0.12 | 0.15 | 0.13 | 0.15 | 0.14 | 0.16 | 0.15 |
| ***N*** | 1044 | 1044 | 1044 | 1044 | 1044 | 1044 | 1044 | 1044 |

Notes:Clustered standard errors by date of random assignment in brackets. Intent-to-treat (ITT) parameters estimated by multivariate OLS models that include as control variables: gender, age, scholing, houshehold assets index, districts, place of residence (Ger), marital status, and subjective expectation related to likelihood of getting a job, ambition to succeed in labor markets, self-reliance to get a job, government responsibility to provide a job, and date of random assignment. fixed effects. Treatment on the Treated (TOT) parameters estimated by 2SLS that instruments the treatment indicator (T) by the randomly assigned treatment status (Z) of participants. Poor is defined as 1 for those in the bottom quantile of the household wealth assets index. This index is estimated by PCA and includes indicators for whether unit lives in a slum (Ger), unit has car, motocycle, computer at home, washing machine, vaccum cleaner, TV and refrigerator. 'Optimistic' is a dummy variable that takes the value 1 for those who at baseline answered they felt optimistic to find a job in the next six months, 0 otherwise. The base category for schooling is technical or university higher education.

**Table 4B: Heterogenous Impacts for VT Training Program, 12 months**
**Mongolia Vocational Training, 2014-2016**

| | employment 12-month | | wages 12-month | | skills match 12-month | | self-employment 6-months | |
|---|---|---|---|---|---|---|---|---|
| | ITT | TOT | ITT | TOT | ITT | TOT | ITT | TOT |
| ***VT Program*** | 0.003 | 0.009 | 37816 | 90873 | 0.013 | 0.033 | 0.027 | 0.066 |
| | (0.045) | (0.097) | (31409) | (68817) | (0.044) | (0.095) | (0.020) | (0.044) |
| ***VT *Males*** | 0.023 | 0.049 | 72334 | 151347 | 0.069 | 0.144 | 0.033 | 0.070 |
| | (0.063) | (0.012) | (64194) | (127318) | (0.086) | (0.170) | (0.050) | (0.098) |
| ***VT Program*** | 0.033 | 0.065 | 87083** | 186595** | 0.039 | 0.088 | 0.039 | 0.088 |
| | (0.045) | (0.095) | (42285) | (86869) | (0.043) | (0.093) | (0.043) | (0.093) |
| ***VT * age 15 -21*** | -0.062 | -0.119 | **-70079*** | **-130343*** | -0.006 | -0.009 | -0.006 | -0.009 |
| | (0.055) | (0.100) | (40511) | (68525) | (0.044) | (0.080) | (0.044) | (0.080) |
| ***VT Program*** | 0.034 | 0.073 | 88872** | 197889** | 0.065 | 0.144 | 0.065*** | 0.145*** |
| | (0.045) | (0.098) | (39253) | (85734) | (0.042) | (0.095) | (0.024) | (0.048) |
| ***VT *poor*** | -0.082 | -0.210 | **-97829*** | **-242598*** | -0.106 | -0.267 | **-0.097*** | **-0.245*** |
| | (0.077) | (0.185) | (53283) | (128834) | (0.070) | (0.171) | (0.057) | (0.132) |
| ***VT Program*** | 0.161** | 0.287* | 134847** | 258922** | 0.065 | 0.128 | 0.079** | 0.154*** |
| | (0.080) | (0.152) | (55701) | (106855) | (0.073) | (0.136) | (0.031) | (0.059) |
| ***VT * less high school*** | **-0.307***** | **-0.746**** | **-230586***** | **-562700***** | -0.084 | -0.185 | **-0.118**** | **-0.273*** |
| | (0.114) | (0.296) | (80503) | (201676) | (0.097) | (0.236) | (0.058) | (0.152) |
| ***VT * high school*** | **-0.171**** | **-0.296*** | -49874 | -71908 | -0.017 | -0.025 | -0.034 | -0.052 |
| | (0.092) | (0.168) | (83061) | (153073) | (0.079) | (0.141) | (0.077) | (0.080) |
| $R^2$ | 0.17 | 0.17 | 0.19 | 0.17 | 0.16 | 0.15 | 0.15 | 0.14 |
| ***N*** | 975 | 975 | 975 | 975 | 975 | 975 | 975 | 975 |

Notes:Clustered standard errors by date of random assignment in brackets. Intent-to-treat (ITT) parameters estimated by multivariate OLS models that include as control variables: gender, age, scholing, houshehold assets index, districts, place of residence (Ger), marital status, and subjective expectation related to likelihood of getting a job, ambition to succeed in labor markets, self-reliance to get a job, government responsibility to provide a job, and date of random assignment. fixed effects. Treatment on the Treated (TOT) parameters estimated by 2SLS that instruments the treatment indicator (T) by the randomly assigned treatment status (Z) of participants. Poor is defined as 1 for those in the bottom quantile of the household wealth assets index. This index is estimated by PCA and includes indicators for whether unit lives in a slum (Ger), unit has car, motocycle, computer at home, washing machine, vaccum cleaner, TV and refrigerator. 'Optimistic' is a dummy variable that takes the value 1 for those who at baseline answered they felt optimistic to find a job in the next six months, 0 otherwise. The base category for schooling is technical or university higher education.

Table 5: Intent-to-Treat Impacts by Field of Study, Mongolian VT Program

| | 6 months after treatment | | | | 12 months after treatment | | | |
|---|---|---|---|---|---|---|---|---|
| | employment | earnings | skills match | self-employment | employment | earnings | skills match | self-employment |
| Mechanical/Machinery ($\beta_1$) | **0.129**** | -21703 | 0.094 | 0.012 | -0.004 | 48819 | -0.023 | -0.003 |
| | (0.062) | (68031) | (0.073) | (0.041) | (0.056) | (78553) | (0.057) | (0.043) |
| Hairdressing/Beauty career ($\beta_2$) | **0.236***** | **129943**** | **0.128**** | **0.080*** | 0.014 | 63719 | -0.023 | **0.100***** |
| | (0.078) | (50981) | (0.062) | (0.048) | (0.064) | (55939) | (0.079) | (0.036) |
| Craftmanship ($\beta_3$) | 0.013 | 97720 | -0.044 | -0.045 | -0.064 | **-111548***** | -0.083 | -0.072 |
| | (0.072) | (110417) | (0.079) | (0.052) | (0.066) | (38514) | (0.077) | (0.052) |
| Agriculture /Gardening ($\beta_4$) | -0.009 | 38960 | 0.113 | -0.009 | -0.110 | **-194734***** | -0.114 | **-0.074**** |
| | (0.093) | (61186) | (0.071) | (0.049) | (0.082) | (53043) | (0.091) | (0.035) |
| Cooking/Baking ($\beta_5$) | -0.034 | -37804 | 0.011 | -0.003 | -0.016 | 17718 | 0.073 | 0.027 |
| | (0.075) | (45130) | (0.065) | (0.044) | (0.089) | (62730) | (0.093) | (0.054) |
| Services ($\beta_6$) | 0.082 | 9790 | 0.053 | -0.049 | -0.081 | -96279 | 0.064 | 0.021 |
| | (0.118) | (60613) | (0.116) | (0.055) | (0.092) | (52410) | (0.082) | (0.055) |
| p-value: F-test : $\beta_1=\beta_2=\beta_3=\beta_4=\beta_5=\beta_6$ | 0.044 | 0.096 | 0.062 | 0.343 | 0.724 | 0.039 | 0.525 | 0.003 |
| p-value: F-test : $\beta_1=\beta_2$ | 0.231 | 0.052 | 0.638 | 0.278 | 0.822 | 0.857 | 0.991 | 0.092 |
| p-value: F-test : $\beta_1=\beta_3$ | 0.174 | 0.448 | 0.073 | 0.313 | 0.399 | 0.069 | 0.398 | 0.278 |
| p-value: F-test : $\beta_1=\beta_4$ | 0.148 | 0.525 | 0.810 | 0.753 | 0.274 | 0.022 | 0.388 | 0.223 |
| p-value: F-test : $\beta_1=\beta_5$ | 0.096 | 0.836 | 0.260 | 0.807 | 0.910 | 0.725 | 0.358 | 0.596 |
| p-value: F-test : $\beta_1=\beta_6$ | 0.686 | 0.734 | 0.748 | 0.373 | 0.473 | 0.157 | 0.376 | 0.733 |
| p-value: F-test : $\beta_2=\beta_3$ | 0.014 | 0.793 | 0.005 | 0.044 | 0.373 | 0.010 | 0.532 | 0.002 |
| p-value: F-test : $\beta_2=\beta_4$ | 0.012 | 0.217 | 0.829 | 0.138 | 0.197 | 0.001 | 0.374 | 0.002 |
| p-value: F-test : $\beta_2=\beta_6$ | 0.007 | 0.005 | 0.103 | 0.159 | 0.783 | 0.509 | 0.456 | 0.221 |
| p-value: F-test : $\beta_2=\beta_5$ | 0.202 | 0.114 | 0.557 | 0.052 | 0.417 | 0.061 | 0.437 | 0.200 |
| **N** | 1044 | 1044 | 1044 | 1044 | 975 | 975 | 975 | 975 |
| **$R^2$** | 0.14 | 0.16 | 0.16 | 0.17 | 0.17 | 0.20 | 0.16 | 0.16 |

Notes: Clustered standard errors by date of random assignment in parenthesis. Average impacts estimated by a multivariate OLS regression model that include as control variables gender, age, scholing, household wealth assets index, district and place of residence (Ger), marital status, subjective expectations related to likelihood of getting a job, ambition to succeed in labor markets, self-reliance to get a job, government responsibility to provide a job, and date of random assignment fixed effects. The main independent variables are dummy variables by field of study that take the value 1 if unit chose the corresponding field, 0 otherwise.

**Table 6: Intent-to-treat impacts of information letters intervention on intermediate outcomes**
**Mongolia Vocational Training, 2014-2016**

| | Days attended VT | Complete VT | Got VT Qualification | Got VT Certificate | Dropout (adm. variable) |
|---|---|---|---|---|---|
| **Panel A:Extensive Margin** | | | | | |
| *treated letters* | 3.028 | 0.062 | 0.163 | 0.001 | -0.012 |
| | (3.357) | (0.095) | (0.169) | (0.077) | (0.032) |
| **N** | 360 | 359 | 359 | 360 | 382 |
| $R^2$ | 0.21 | 0.31 | 0.27 | 0.30 | 0.29 |
| **Panel B:Intensive Margin** | | | | | |
| *number letters received* | **2.341**** | **0.068**** | **0.085**** | **0.050*** | **-0.077**** |
| | (1.132) | (0.031) | (0.043) | (0.026) | (0.034) |
| **N** | 360 | 359 | 359 | 360 | 381 |
| $R^2$ | 0.23 | 0.33 | 0.30 | 0.31 | 0.39 |

Notes: ITT parameters estimated by multivariate OLS models that include training center fixed effects. Control variables include gender, age, schooling, household assets index, district and place of residence (Ger), marital status, unemployed status, whether has VT trilateral, contract, subjective expectations on likelihood of getting a job, ambition to succeed in labor market, government responsibility to provide jobs. Standard errors (in parentheses) are clustered by the training center in which participants enrolled. All outcome variables are self-reported with the exception of 'dropouts'.

**Table 7: Information letters ITT Impacts on intermediate outcomes: Heterogeneous Impacts**
**Mongolia Vocational Training, 2014-2016**

| **Panel A: Extensive Margin** | Days attended VT training | Completed VT training | Got VT Qualification | Got VT Certificate | Dropout (adm. variable) |
|---|---|---|---|---|---|
| treated letters | 2.898 | 0.031 | 0.198 | -0.001 | -0.015 |
| | (3.069) | (0.110) | (0.197) | (0.095) | (0.043) |
| treated letters* males | 0.479 | 0.111 | -0.131 | -0.001 | 0.011 |
| | (8.483) | (0.219) | (0.164) | (0.117) | (0.102) |
| treated letters | 1.341 | 0.015 | 0.187 | -0.059 | -0.006 |
| | (3.643) | (0.103) | (0.203) | (0.089) | (0.042) |
| treated letters*age 15-21 | 4.512 | 0.132 | -0.067 | 0.170 | -0.012 |
| | (4.191) | (0.106) | (0176) | (0.155) | (0.074) |
| treated letters | 2.246 | 0.030 | 0.17 | 0.017 | 0.011 |
| | (3.152) | (0.099) | (0.173) | (0.072) | (0.036) |
| treated letters* poor | 3.593 | 0.132 | -0.047 | 0.084 | -0.113 |
| | (4.943) | (0.179) | (0.163) | (0.113) | (0.071) |
| treated letters | 4.309 | 0.092 | 0.272 | 0.075 | 0.017 |
| | (5.205) | (0.176) | (0.216) | (0.167) | (0.036) |
| treated letters*less high school | 4.639 | 0.199 | 0.010 | 0.052 | -0.039 |
| | (6.497) | (0.169) | (0.187) | (0.194) | (0.102) |
| treated letters* high school | -3.936 | -0.125 | -0.222 | -0.168 | -0.041 |
| | (5.233) | (0.191) | (0.184) | (0.195) | (0.054) |
| **N** | 360 | 359 | 359 | 360 | 382 |
| $R^2$ | 0.21 | 0.31 | 0.27 | 0.30 | 0.29 |

continued….

***continuation…….***

| | Days attended VT training | Completed VT training | Got VT Qualification | Got VT Certificate | Dropout (adm. variable) |
|---|---|---|---|---|---|
| **Panel B:Intensive Margin** | | | | | |
| number letters received | 1.984** | 0.044* | 0.091* | 0.048* | -0.061* |
| | (0.093) | (0.025) | (0.054) | (0.028) | (0.031) |
| number letters received * males | 1.302 | 0.087 | -0.023 | 0.006 | -0.059 |
| | (2.238) | (0.066) | (0.058) | (0.039) | (0.037) |
| treated letters | 2.026* | 0.062* | 0.099** | 0.041 | -0.082** |
| | (1.211) | (0.035) | (0.045) | (0.029) | (0.039) |
| treated letters* age1521 | 0.848 | 0.021 | -0.047 | 0.031 | 0.018 |
| | (1.050) | (0.037) | (0.037) | (0.034) | (0.025) |
| treated letters | 2.330* | 0.063** | 0.081** | 0.048** | -0.078** |
| | (1.210) | (0.031) | (0.041) | (0.027) | (0.036) |
| treated letters* poor | -0.218 | 0.019 | 0.021 | 0.004 | 0.006 |
| | (1.569) | (0.043) | (0.039) | (0.028) | (0.023) |
| treated letters | 1.945 | 0.063 | 0.104* | 0.067 | -0.051 |
| | (1.503) | (0.053) | (0.054) | (0.049) | (0.035) |
| treated letters*less high school | 0.497 | 0.001 | -0.047 | -0.040 | -0.017 |
| | ( 1.703) | (0.049) | (0.052) | (0.041) | (0.026) |
| treated letters high school | 0.543 | 0.005 | -0.025 | -0.022 | -0.045 |
| | (1.626) | (0.053) | (0.054) | (0.051) | (0.022) |
| **N** | 360 | 359 | 359 | 360 | 381 |
| $R^2$ | 0.33 | 0.33 | 0.30 | 0.31 | 0.39 |

Notes: Standard errors (in parenthesis) are clustered by the training center to which participants belong. ITT parameters estimated by multivariate OLS models that include training center fixed effects, gender, age, schooling, household wealth assets index, district and place of residence (Ger), marital status, unemployed status, whether unit has VT trilateral contract, subjective expectations on likelihood of getting a job, ambition to succeed in labor market, self-reliance to get a job, government responsibility to provide a job. Estimation sample covers only individuals assigned to the treatment group and who attended the VT courses.

'Poor' is defined as 1 for those in the bottom quantile of the household wealth assets index. This asset index is estimated by PCA and includes indicators for whether unit lives in a slum (Ger), unit has car, motocycle, computer at home, washing machine, vaccum cleaner, TV and refrigerator The base category for schooling is technical or university higher education.

**Table 8: Differential (ITT) Impacts of VT Training by Information Letters Status**

**Mongolia Vocational Training, 2014-2016**

| | employment | | labor income | | skills match | |
|---|---|---|---|---|---|---|
| | 6-month | 12-month | 6-month | 12-month | 6-month | 12-month |
| ***VT Program*** | 0.051 | 0.029 | 70631** | 76710** | 0.054* | 0.054 |
| | (0.047) | (0.040) | (34266) | (34203) | (0.033) | (0.037) |
| ***VT *Letters*** | 0.010 | -0.053 | -44806 | -44305 | 0.018 | -0.053 |
| | (0.049) | (0.054) | (31300) | (43731) | (0.053) | (0.043) |
| ***VT Program*** | 0.050 | 0.012 | 66050** | 59813** | 0.052* | 0.037 |
| | (0.046) | (0.039) | (32594) | (31765) | (0.030) | (0.038) |
| ***VT * number of letters*** | 0.007 | -0.002 | -15248 | 4087 | 0.012 | -0.000 |
| | (0.018) | (0.018) | (10442) | (17185) | (0.018) | (0.014) |
| $R^2$ | 0.12 | 0.17 | 0.15 | 0.19 | 0.15 | 0.16 |
| **N** | 1044 | 975 | 1044 | 975 | 1044 | 975 |

Notes:Clustered standard errors by date of random assignment in brackets. Intent-to-treat (ITT) parameters estimated by multivariate OLS models that include as control variables: gender, age, scholing, houshehold assets index, districts, place of residence (Ger), marital status, and subjective expectation related to likelihood of getting a job, ambition to succeed in labor markets, self-reliance to get a job, government responsibility to provide a job, and date of random assignment.fixed effects. "Letters" is define as 1 for those who are randomly assigned to the treatment information group, 0 otherwise. All control units are inputted the value 0 for both "letters" and "number of letters".

## Appendix Table 1A: Sample of Information Letter submitted to trainees

Mongolian VT Program, 2014-2016

**Dear Mrs. XXX**

According to official statistics in our country, people who ***complete*** vocational training courses show substantial improvement in their labor-market outcomes. Think about these numbers:

- In 2012, people with vocational and professional skills made *35%* more in salaries than people without those skills: the average monthly salary of individuals with vocational and professional skills was 464000 MNT, while the average monthly earnings of individuals without any professional or/and vocational skills was only 342900 MNT.

- In 2012, people with vocational and professional skills took the majority of available jobs: two out of three individuals with vocational and professional skills were employed, while only half of people without vocational and professional skills were employed.

These numbers suggest that ***completing*** your vocational training course might be a good investment. The benefits of vocational training could last for many years to come.

Would you like to improve the chances of being successful in the labor markets? Do you want to get a job?
You could achieve these goals by ***completing*** this vocational training course!

**Your success is in your hands!**

**Appendix Table 2A: Attrition Rates**
**Mongolian VT, 2014-2016**

| | | attrition rate |
|---|---|---|
| Target sample | 1188 | ---- |
| Reach course assignment stage | 1140 | 4.1% |
| Answer baseline survey questionnaire | 1124 | 5.4% |
| Answer first follow-up survey | 1075 | 9.6% |
| Answer second follow-up survey | 1003 | 15% |

Source: Administrative data from VT program

**Appendix Table 3A: Balancing Test by Attrition Status**
**Mongolian VT, 2014-2016**

| | 1st follow-up attrition | | | 2nd follow-up attrition | | |
|---|---|---|---|---|---|---|
| **Socio-Demographics** | Observed | Missing | p-value | Observed | Missing | p-value |
| gender (1=males) | 0.33 | 0.44 | 0.11 | 0.32 | 0.47 | 0.00 |
| age | 22.96 | 22.24 | 0.16 | 22.99 | 22.36 | 0.07 |
| marital status (1=married) | 0.46 | 0.30 | 0.18 | 0.48 | 0.27 | 0.00 |
| residence (1=Ger) | 0.83 | 0.64 | 0.01 | 0.84 | 0.72 | 0.00 |
| less than high school | 0.20 | 0.20 | 0.94 | 0.19 | 0.24 | 0.23 |
| high school | 0.50 | 0.55 | 0.57 | 0.50 | 0.55 | 0.37 |
| technical education | 0.08 | 0.08 | 0.95 | 0.09 | 0.06 | 0.36 |
| college + | 0.20 | 0.16 | 0.52 | 0.20 | 0.14 | 0.09 |
| household size | 4.05 | 3.54 | 0.02 | 4.03 | 4.00 | 0.84 |
| has children | 0.44 | 0.28 | 0.01 | 0.45 | 0.31 | 0.00 |
| live with parents | 0.48 | 0.60 | 0.12 | 0.48 | 0.61 | 0.00 |
| parents have work | 0.29 | 0.44 | 0.02 | 0.28 | 0.42 | 0.00 |
| has disability | 0.04 | 0.04 | 0.80 | 0.04 | 0.04 | 0.90 |
| poverty index | -0.01 | 0.12 | 0.37 | 0.01 | 0.01 | 0.82 |
| **Labor Market and Income** | | | | | | |
| has work experience | 0.62 | 0.50 | 0.09 | 0.62 | 0.52 | 0.04 |
| # weeks of work experience | 5.03 | 0.00 | 0.31 | 5.31 | 0.57 | 0.16 |
| previous vocational training | 0.20 | 0.26 | 0.35 | 0.21 | 0.14 | 0.05 |
| out of LF (child care duties) | 0.27 | 0.12 | 0.01 | 0.28 | 0.16 | 0.00 |
| out of LF (student) | 0.09 | 0.12 | 0.55 | 0.09 | 0.12 | 0.26 |
| out of LF (homemaker) | 0.06 | 0.04 | 0.46 | 0.06 | 0.05 | 0.73 |
| no monthly income | 0.54 | 0.60 | 0.42 | 0.53 | 0.63 | 0.03 |
| has income from remittances | 0.05 | 0.10 | 0.21 | 0.05 | 0.06 | 0.72 |
| has labor market income | 0.14 | 0.12 | 0.63 | 0.14 | 0.11 | 0.36 |
| receive welfare income | 0.15 | 0.12 | 0.49 | 0.15 | 0.12 | 0.33 |
| **Expectations** | | | | | | |
| subjective prob of getting a job | 78.23 | 79.68 | 0.68 | 78.39 | 77.44 | 0.68 |
| optimistic to get a job | 0.68 | 0.70 | 0.78 | 0.68 | 0.69 | 0.71 |
| ambition to succeed in labor market | 0.88 | 0.89 | 0.86 | 0.89 | 0.88 | 0.98 |
| personal responsibility to get a job | 66.71 | 63.87 | 0.48 | 66.74 | 65.22 | 0.56 |
| government responsibility to provide a job | 85.48 | 92.34 | 0.02 | 85.20 | 90.72 | 0.00 |
| plan to complete VT | 0.94 | 0.90 | 0.13 | 0.95 | 0.90 | 0.04 |
| number of days plan to attend VT | 34.54 | 31.63 | 0.15 | 34.61 | 32.72 | 0.17 |
| **Elegibility** | | | | | | |
| eligible to VT due to unemployment status | 0.84 | 0.86 | 0.81 | 0.84 | 0.85 | 0.71 |
| employment as main reason to join VT | 0.79 | 0.68 | 0.05 | 0.80 | 0.68 | 0.00 |
| applied to cooking/baking VT courses | 0.12 | 0.06 | 0.20 | 0.11 | 0.12 | 0.79 |
| applied to beauty/hairdressing VT courses | 0.24 | 0.36 | 0.06 | 0.24 | 0.27 | 0.46 |
| applied to mechanical/machinery VT courses | 0.25 | 0.24 | 0.87 | 0.24 | 0.25 | 0.98 |
| applied to craftmanship VT courses | 0.15 | 0.24 | 0.12 | 0.15 | 0.21 | 0.08 |
| applied to agriculture/gardening VT courses | 0.12 | 0.06 | 0.15 | 0.13 | 0.08 | 0.07 |
| N | 1069 | 50 | | 996 | 121 | |

Notes: sample means by attrition status in first and second follow-up survey data. p-values from standard t-test of equality of means.

**Appendix Table 4A: Mongolian VT Take Up**
**Mongolian VT, 2014-2016**

| | VT Treated group | VT Control group | Total |
|---|---|---|---|
| **Random allocation to 1st treatment: VT training** | 766 | 374 | 1140 |
| Enroll to VT training courses | 439 | 27 | 466 |
| Do not enroll to VT training treatment | 327 | --- | ---- |
| | | | |
| answer baseline survey and take treatment | 420 | | |
| answer fisrt follow-up survey and take treatment | 399 | | |
| answer second follow-up survey and take treatment | 373 | | |
| | | | |
| | VT Treated with Letter | VT Treated w/o Letter | Total |
| **Random allocation to 2nd treatment: "letters"** | 291 | 119 | 410 |
| Take "letters" treatment | 256 | ---- | 256 |
| Do not take "letters" treatment | 35 | ---- | 35 |
| | | | |
| answer baseline survey and take treatment | 253 | ---- | |
| answer fisrt follow-up survey and take treatment | 241 | ---- | |
| answer second follow-up survey and take treatment | 224 | ---- | |

Source: Administrative data from VT program

Appendix Table 5A: First Stage of 2SLS Model

| | 6-months | 12-months |
|---|---|---|
| Randomization (Instrument) | 0.419*** | 0.427*** |
| | (0.026) | (0.027) |
| constant | -0.271 | -0.293 |
| | (0.466) | (0.488) |
| N | 1044 | 975 |
| $R^2$ | 0.35 | 0.36 |
| F-statistic of first stage regression | 24.73 | 23.72 |

Notes: Standard errors in parenthesis. First stage regresion uses the same control covariates as the second stage regression. Covariates are describe in footnote of Table 1.