Demand-driven vocational skills training for the youth: Experimental evidence from Mongolia[1]

Maria Laura Alzua[*], Soyolmaa Batbekh[+], Altantsetseg Batchuluun[♣], Bayarmaa Dalkhjav[©] and Jose Galdo[&]

Abstract

Youth unemployment is a global concern due to its high incidence and potential threat to social cohesion. This study uses a randomized control trial to provide analysis and insights on the effectiveness of a demand-driven vocational training program that targets disadvantaged youth in Mongolia. This transition country, which changed its economic structure from a communist, centrally planned economy to a free-market economy in a relatively short period, offers a new setting to tests the effectiveness of standard active labor market policies. This study reports positive and statistically significant short-term impacts for monthly earnings, skills match and self-employment. Substantial heterogeneity emerges as these positive effects are concentrated among the older, less poor and more educated young individuals. A second intervention that randomly assigns the provision of weekly letters with information on market returns to vocational training for participants shows positive impacts on the length of exposure and successful completion to and of the program. These positive effects, however, are only observed at the intensive margin (number of letters) 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

[1] This work was carried out with financial and scientific support from the Partnership for Economic Policy (PEP), 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.

[*] Maria Laura Alzua, malzua@depeco.econo.unlp.edu.ar , CEDLAS-Universidad Nacional de la Plata – Conicet-PEP, Calle 6 entre 47 y 48, of 322, (1900), La Plata, Buenos Aires, Argentina
[+] Soyolmaa Batbekh, soyol_96@yahoo.com ,National university of Mongolia, Ulaanbaatar, Mongolia
[♣] Altantsetseg Batchuluun, altantsetseg.b@num.edu.mn ,National University of Mongolia, Ulaanbaatar, Mongolia
[©] Bayarmaa Dalkhjav, dbayarma@yahoo.com , School of Economic Studies Ulaanbaatar, Mongolia
[&] Jose Galdo, Jose_Galdo@carleton.ca, SPPA and Department of Economics Carleton University

1. Introduction

Youth employment is a ubiquitous problem in most developed and developing countries. Over 73 million youth aged 15 to 24 are unemployed worldwide and around 20 percent of the world´s young people are not in education, employment or training (ILO 2017). The labor market conditions of disadvantaged youth are even more dramatic since they disproportionally lack access to (decent) jobs that could lift them out of poverty through contractual relationships and steady paychecks and schedules (ILO 2015). In Mongolia, the setting of our study, the youth unemployment rate reaches 23 percent in 2017, while the share of young individuals who are not in education, employment or training tops 25 percent (Shatz et al. 2015). Indeed, this situation entails a massive waste of economic resources and a threat to social cohesion.

In this paper, we focus on assessing the effectiveness of an active labour market program (ALMP) that targets poor and unemployed youth in Ulaanbaatar, the capital of Mongolia. It aims 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 whatsoever about its effectiveness in central Asia. The up-to-date, meta-analysis work from Card et al. (2010), Kluve et al. (2016) and Puerto et al. (2017), reveal this important gap in the literature. Most of the evidence accumulated in the past few decades come mainly from developed countries, Latin America, or more recently, from Africa.

The large body of evidence thoroughly presented and discussed in recent systematic reviews of ALMAPs (e.g., Puerto et al. 2017), points out that contextual reality matters for the magnitude and statistical relevance of labor-market outcomes. In

this front, Mongolia is an interesting setting because it belongs to what it is called "transition countries", countries whose labor markets transited rapidly from Communism to a free-market economy. In fact, Mongolia changed its economic structure in quite few years from a centralized, communist economy in which (official) youth unemployment was very low or inexistent, to a free-market economy in which one observes one of the highest rates of unemployment for the youth worldwide. How vocational skills training interventions in this type of environment would foster employment and wage growth for young, vulnerable and unemployed individuals is of relevant policy interest.

The Mongolian vocational skills training program follows a specific type of ALMP called "demand driven", which combine in-class training in selected vocational skills followed by on-the-job training in the form of paid internships (e.g., Galdo et al. 2008, Ibarrarán and Rosas Shady 2009). Under this training approach, private institutions offer specific training courses in occupations with actual labor demand. "Demand driven" programs became a widely used ALMP in Latin American countries since the mid-nineties and the assessment of its operations show positive impacts on employment and earnings particularly for disadvantaged women (Betcherman et al. 2007). Whether such market-based, training scheme works in transition economies such as Mongolia remains an important policy question.

From a methodological standpoint, we implement this market-based, program design following a standard randomized-control-trial (RCT) approach, which allow us to identify, under weak conditions, causal treatment effects on employment and earnings. In fact, this is the first ALMP in central Asia that follows an experimental counterfactual design. Although RCTs have long been used in the U.S. in programs such as the National

Supported Work (NSW) and the Job Training Partnership Act (JTPA), experimental evidence from developing countries is more limited albeit it has been increasing rapidly during the past decade particularly in Latin America and Africa[2].

One important source of variation in the magnitude of treatment effects for training programs is the lack of compliance with the treatment design (Heckman et al. 2000). It is common to observe disadvantage individuals who are not able to complete the full duration of training programs due to personal or institutional barriers or lack of information/knowledge on the returns to training. No matter the specific source of this empirical regularity, the effectiveness of training programs depends on the length of exposure to the intervention as shown in Choe et al. (2014) and Galdo et al. (2014). This opens the room for some policy choices that could induce longer training exposure for potential dropouts. To this end, we use a second randomization design within the group of participants in order to allocate randomly the provision of personalized (weekly) letters with information about the returns to vocational training in Mongolia. Lack of knowledge about market returns to training in a setting that transited from Communism to a market-based economy could lead participants to uninformed choices. While the importance of providing information about market returns have been shown 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 ALMP in a developing country or transition 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

[2] See Attanasio et al. 2011, Card et al. 2011, Ibarrarán et al. 2015 for Latin America, and Bandiera et al. 2014, Blattman et al. 2014, Alvarez de Acevedo et al. 2013, Hicks et al. 2013, and Cho et al 2013 for Africa.

observe positive and statistically significant impacts for self-employment and skills match, while small but not significant impacts for dependent work. Important heterogeneities in the results emerge as the older, more educated and less poor individuals benefit more from this intervention. Unlike recent training interventions in developed (Card et al. 2010 and Card et al. 2017) and developing settings (Attanasio et al. 2011, Alzúa et al. 2016, Diaz and Rosas 2016), we do not find differential treatment effects by gender. Finally, provision of weekly letter to trainees with information on the market returns for vocational training in Mongolia leads to significant gains in the length of exposure to the program and lower dropout rates. Yet, these positive results do not translate in terms of higher employment and earnings outcomes.

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.

2. Institutional Setting

Mongolia is a small, transition country with population of slightly above three million. It is a landlocked area located between Russia and China, as one can see in Figure 1. Ethnic Mongols account for about 95 percent of the population and the most common language is Mongolian spoken by most of the population. It is one of the least densely populated countries in the world, with almost half of its total population living in the city of Ulaanbaatar, the country's capital. Mongolia's population is relatively young as 42 percent of its people is younger than 24 in 2018. Following the dismantlement of the

former USSR in early 1990s, Mongolia's economy changed dramatically from a centrally planned command system to a market-based one. Soviet assistance disappeared almost overnight after accounting for almost one third of its GDP.

Today, Mongolia has a GDP per capita of US$13000 (PPP), which makes this economy comparable to countries such as South Africa or Sri Lanka. As Mongolia is a resource rich country with large deposits of copper, gold, coal, and uranium, its mining sector accounts for almost one fifth of GDP and 40 percent of its exports. This sector has transformed Mongolia in few decades from a traditional agricultural- and herding-based economy to a resource-based economy. Still, agriculture is the largest employer in the country with 30 percent of its labor force located in this sector.

Before the transition, the Mongolian labor markets was characterized by high levels of labor force participation reaching more than 75 percent in the early 1990's. Official statistics on unemployment was non-existent due to the "everyone should work" policy that lead the youth unemployment rate to close to zero. Only after 1992, Mongolia started measuring and reporting unemployment rates. Due to the economic reforms implemented in the 1990s and onwards, such as privatizations and price liberalization, which lead to structural changes in its economy, labor force participation started falling while unemployment rates increased dramatically. Indeed, youth unemployment reached 23 percent in 2017, almost twice the global rate of youth unemployment (13 percent). Moreover, the share of inactive youth aged 15 to 29 who are not in education, employment or training (NEET), has been consistently above 20 percent since the early 2000s (Shatz et al. 2015). This NEET rate is disproportionally higher for youth women relative to men and for urban households relative to rural ones.

3. The Mongolian Vocational Training Program

The Mongolian vocational training program (VTP) was introduced in 2003 as an effort to counteract the high levels of youth unemployment that accompanied the market-oriented, structural reforms implemented since the mid-1990s. It is the oldest and the largest active labor market policy currently operating in Mongolia. Its primary goal is to help unemployed people to get jobs through the combination of vocational skills training followed by internships in private firms. In this regard, the Mongolian VTP follows key aspects of standard "demand driven" training approaches, wherein the provision of skills training is aligned to the real needs of local employers.

The rationale for "demand driven" programs is twofold. Firstly, it aims to de-centralize the traditional supply of vocational training by public institutions in favor of fostering a market of private institutions that can offer relevant and up-to-date training services. To that end, established private firms usually bid to offer training to the targeted group following market-based mechanisms. Secondly, it aims to train beneficiaries in vocations or jobs that the market demands by combining traditional training in the classroom with on-the-job training in the form of internships. For this purpose, private suppliers of training courses connect participants with private productive firms through internships opportunities. "Demand driven" vocational training programs were initially implemented during the nineties across several Latin American countries (Betcherman et al. 2007) after going through the same type of market-based, structural economic reforms as seen in Mongolia.

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 alike.

The VTP is financed by the State Employment Promotion Fund which targets poor, unemployed or vulnerable to unemployment youth aged 15 to 30. 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 the training institutions through a competitive bidding process. Institutions must show evidence of ability to provide adequate training at the time of submitting their bids. The selection criteria for training institutions includes variables such as legal registration, curriculum quality, teaching quality, adequacy of training places 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 uses a randomized controlled trial to identify and measure its impact. That year, the Metropolitan Employment Department (MED) selected 47 training institutions in Ulaanbaatar that offered 141 courses in around 80 different vocational skills such as construction, hairdressing, cooking, heavy machinery operations, among others. The length of training varies from 20 to 45 days, depending on the type of vocation, with a minimum duration of 144 hours per course. According to the program's regulations, traditional classroom teaching should not exceed 30 percent of the total hours. Practical on-the-job training and internships should account for the remaining hours. Compared to other vocational training programs in developing countries (e.g., Mckenzie 2017), the VTP in Mongolia is shorter and thus, less expensive. The tuition fee was set between 140,000 MNT and 220,000 MNT (approximately between USD 90 and 140) per participant in 2013, which is paid in four quotas using certificate notes, valid only when carrying the trainee's

signature. The program offers no other additional benefits such as transportation, meals, or insurance fees. Due to budgetary constraints, the official number of training slots was originally set to 1400 in 2013.

Prospective trainees aged 15 to 30 should attend their respective Khoroo offices for assessment purposes.[3] After filling up a short baseline questionnaire, an administrative officer screens each application for eligibility purposes and sends all suitable applicants to a district labor office in which each applicant alongside a labor officer chooses her preferred vocational skills training course in a given training institution following a first-come-first-serve rule. For securing participation, eligible individuals must sign a contractual agreement with the corresponding labor office. Up until the spring of 2013, participants were required to sign a 'trilateral' contract that involves the signatures of an EPSC district officer, MED officer, and the beneficiary. Thus, it was solely the responsibility of training institutions to obtain internships for trainees, although its enforcement was not required through contractual agreements. After that date, the EPSC changed this 'trilateral' contractual agreement to a 'quadrilateral' one by adding up the signature of a prospective employer. In practice, this means that both trainees and training centers are equally in charge of securing internships before participation takes place, which is enforced by contractual agreement. As we will see in section 5, this institutional change created an important slowdown in the registration and enrolment processes, which in turn affected the share of no-shows.

[3] Khoroos are the administrative subdivisions of Ulaanbaatar, the capital of Mongolia.

4. Evaluation Design

The evaluation design is defined by the random allocation of eligible individuals to treatment and control groups. The RCT setup is implemented on a continuum basis as part of the registration process and within the pool of prospective trainees who comply with the eligibility rules. Registration took place between August 26th and November 22th, 2013. Each day during that period, the flow of eligible applicants is randomly assigned to either the treatment or control groups following a 2:1 allocation rule. As a result, 1188 eligible applicants were randomly allocated to either group including 774 applicants (65.2 percent) to the treatment group and 414 (34.8 percent) to the control group, as it is shown in Table 2.[4]

Individuals in the treatment group are distributed across 141 courses (classes) within 47 selected training centers. The class size varies highly across training courses – ranging from three to 30 participants- depending on the specific course. The average number of MED-funded students is 9.6 per class. However, actual class sizes can be slightly larger as training institutions are entitled to recruit privately funded students if the targeted number of students per class is not attained. In fact, this happened in some courses, although its significance is marginal as the pattern of small class sizes is observed in most courses.

We incorporated a second, independent random allocation design as part of the evaluation design to evaluate whether providing information to trainees about market

[4] 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.

returns to training effects their length of exposure to the program. Administrative data shows that dropout rates is particularly high for this Mongolian VTP. Since no evidence on the labor-market impacts for this ALMP exists, one could argue that the average participant might not be fully aware of the labor-market benefits of completing this training initiative. This information-constraint feature is even more important in settings such as Mongolia that transited almost overnight from a state-controlled economy, in which official unemployment rates for the youth was non-existent, to a market-based economy. Inspired by Jensen (2010), we add an information design feature to our evaluation framework that consist in the random allocation of weekly letters to participants with information on market returns to vocational training. In the context of formal schooling, Jensen (2010) shows that students tend to underestimate the returns to formal schooling yet when correctly informed, enrolment in the following year increases as well as the average years of formal schooling in Dominic Republic. In the context of vocational training programs, Galdo et al. (2013) and Choe et al. (2014) show for Peru and South Korea, that failure of participants to complete training programs is pervasive for the returns to training.

We thus randomly assigned the provision of weekly information letters within the group of participants who actually takeup the training program. Random allocation of letters is implemented at the class level, rather than at an individual level, to prevent spillover effects. The treatment itself consists of weekly letters delivered to each student in selected classes, with comparative information about labor market outcomes of skilled and unskilled workers in Mongolia. The letters clearly stated market wages for occupations in sectors that are similar to that of those undergoing the training, compared to wages for jobs filled by unskilled workers. Table Appendix 1A show a typical

letter submitted to students. We randomly assigned 101 classes to the information treatment group and 40 classes to the information control group.

5. Data, balancing tests, and take-up assessment

The empirical framework is based on individual-level, survey data including a baseline collected in the fall of 2013 and two follow-up surveys collected six and twelve months after training. Figure 2 portrays the timeline of the intervention and data collection. This evaluation data includes information related to socio-demographic variables, formal schooling and training, labour-market outcomes as well as detailed information on participation in the Mongolian VTP. Relative to the original random assignment sample, data attrition reaches 5.4 percent at baseline, 9.6 for the first follow up survey and 15 percent for the second follow up survey as shown in Appendix Table 2A. Although attrition seems to be non-random, it is somewhat low and affects both treatment and control groups evenly.[5] This survey data is complemented by administrative information available from 46 out of 47 training institutions participating in this training program. This institutional data includes variables such as the number of instructors per classroom, average class size, expenditure per student and salaries paid to instructors. These variables will be used to explore the relationship between the quality of the training centers and the magnitude of the 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

[5] 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, has 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 the treatment effects.

information letters within the group de individuals who take up the treatment (right panel). Baseline data shows that the typical applicant is 23 years old, female (65 percent) and poor (83 percent lives in (Gers) poor housing projects). Almost half of the sample are married (46 percent), have children (42 percent) and still live in the same house along with their parents (47 percent). On average, this sample shows high levels of formal schooling (80 percent has at least high school) and prior labour experience (60 percent). The p-values for the coefficients of OLS models that regress the treatment status on baseline covariates (left panel) are above 0.10 in all cases, which indicate that individuals in the treatment and control groups come from the same population.

For the information (letters) treatment assignment, 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 the experimentally determined treatment groups, although we reject this equality in some few variables that are mainly related to the chosen vocations. This is expected since random allocation to this second information treatment is done at the course level rather than at the individual level and within the set of participants who take-up the vocational skills training.

As administrative data reveals lack of full compliance to the treatment, it is important to assess the determinants of take-up for this vocational training program due to its implications for the empirical assessment of treatment effects. Out of the 766 applicants randomly assigned to vocational skills treatment group, 327 did not show up for training (42 percent). Appendix Table 4A shows detailed information on the enrolment numbers. Self-reported survey information indicates that among those who did not take the treatment, 35 percent declare family and personal commitments (e.g., household chores, pregnancy), 30 percent started a new job right after enrolment, while

31 declare not be able to comply with the VTP signed contract (i.e., 'trilateral' vs 'quadrilateral' contracts). From a policy standpoint, it is therefore important to assess empirically the determinants of take-up as it might have important insights for the operation of the program (e.g., targeting, eligibility rules, institutional requirements), as well as practical implications for 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 1 for those treatment group individuals who take the treatment and 0 for those treatment group individuals who did not take the treatment. We use a rich set of independent, baseline covariates including standard socio-demographic and labor-market variables, prior labor-market outcomes, VTP institutional variables and self-reported expectations on training and performance in the labor markets. Results indicate that a handful of socio-demographic variables are statistically correlated to take-up decisions. On average, gender, household wealth, age and formal schooling matter for take-up rates as women, wealthier individuals, older, and more educated people are more likely to participate in the program relative to men, poorer, younger and less educated individuals, respectively. Importantly, we do not find any meaningful statistical relationship between take-up and labor-market variables at baseline. This pattern run against what is observed in other active labor market programs in which variables related to the labor markets emerge as the main determinants of take-up.

Moreover, institutional variables that govern the operations of the Mongolian VTP emerge as important take-up predictors. Indeed, individuals who are required to present 'quadrilateral' signed contracts are 54 percentage points less likely to take-up the treatment relative to individuals who need to present 'tri-lateral' signed contracts.

This institutional requirement thus constitutes a critical barrier for take-up. Likewise, the likelihood of attending the courses is statistically related to the chosen vocational skills courses. Individuals who initially selected courses related to hairdressing and artisanship are less likely to attend training (-20 percentage points), while individuals who selected mechanical and machinery related courses are more likely (18 percentage points).

Table 2 also shows that take up decisions are associated to self-reported expectations with respect to training, labor-markets, and the role of government on facilitating jobs to the youth. Individuals who feel optimistic to get a job or those who consider that governments should play an important role in facilitating jobs to the youth disproportionally take-up the treatment. On the other hand, individuals who self-report having 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 the joint significance at the bottom of Table2, socio-demographics and institutional variables (contractual agreements) are the most important predictors of take-up rates, while prior labor market outcomes are not statistically associate to take-up decisions.

6. Empirical Framework and Results

Due to the lack of full compliance with the random allocation to treatment, we follow the standard approach in the literature and consider the estimation of two parameters of interest, the intent-to-treat (ITT) and the effective treatment-on-the-treated (TOT) (e.g., Angrist and Pischke 2009). The estimation of the intent-to-treat parameter is based on a standard, multivariate linear regression function of the form,

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

where Y_i is the outcome of interest for individual i, Z_i is the treatment indicator that takes the value 1 for those offered the treatment, 0 otherwise. X_i are individual- and household-level baseline control variables and ϵ_i is the error term[6]. As 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, τ_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 the actual participation in the training program (T) is instrumented by the randomly allocated treatment status (Z) ,

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

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

Table 3 presents our main results for four outcomes of interest: employment, monthly earnings, skills match and self-employment, six and twelve months after the 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 (6 months) treatment effects, while the lower panel shows the medium-term (12 months) mean impacts.

[6] Controls variables include gender, age, schooling, poverty index, district and type of dwelling, 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 for a job.

We focus first on the short-term impacts in Table 3. By looking at the point estimates, one observes that the average gain of offering the training is positive and statistically significant for monthly earnings, skills match and self-employment. The magnitude of the effects for monthly earnings is relatively large reaching to 23 percent from a mean of the control group of approximately USD 100. In addition, we observe statistically significant impacts and equivalent to six percentage points for the skills match outcome, which indicates that the vocational skills of participants are better aligned to their job occupations relative to that of individuals in the control group. Moreover, we observe statistically significant effects on self-employment and equal to 3.5 percentage points. Self-employment doubles among VTP participants relative to non-participants, although its incidence within the sample is very low (7 percent) relative to what is commonly observed in other developing countries. Finally, we find positive (5.5 percentage points) but imprecisely measured ITT impacts for the employment variable. When turning our attention to the TOT estimates in the second row, the magnitude of the impacts increases as expected: monthly earnings for those taking the treatment increases in more than 50 percent relative to the mean of the control group, while the average gain for skills match 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 the mean impacts 12 months after completion of the training. For monthly earnings and self-employment variables, the point estimates for both ITT and TOT parameters are quite in line with the short-term findings, as positive and statistically significant effects emerge. Likewise, the average gains for the employment outcome is positive but relatively small and lack statistical precision. On

the other hand, the impacts on skills match dissipates and become statistically not significant one year later. It is likely that over the next 12 months after finishing training, the turnover rates for trainees is relatively high due to precarious labor markets for the youth, and thus switching jobs comes at the cost of a rapid depreciation of the skills gained one year before. This result indicates that in the medium-term, this training initiative is short of achieving one of its promises: matching occupations and vocational skills for the youth.

Heterogeneous effects

To account for the heterogeneity of impacts across sub-groups 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 the less poor), and educational attainment (less than high school versus high school or tertiary education). These policy variables are related to the efficiency of the targeting approach and are commonly used in the assessment of vocational training programs worldwide. As before, we use the same four outcomes of interest six months (Table 4A) and 12 months (Table 4B) after the intervention.

Results highlight the large heterogeneity of vocational training impacts across different demographic groups. Table 4A report that Individuals aged 15 to 21, normally the demographic group at the highest risk of unemployment, benefit the least from the program six month after treatment. According to the TOT point estimates and six months after training, the likelihood of employment, self-employment and skills math is 27, 17 and 17 percentage points lower for the youngest group relative to the cohort aged 22-30, respectively. Twelve months after the intervention, however, these

differences loss statistical significance suggesting a rapid depreciation of the VTP impacts over time for all age groups rather than an improvement in the labor market outcomes for the youngest cohort relative to the older one. Consistent (negative) differential impacts for monthly earnings also emerge for the youngest group six month after the intervention, although the point estimates become significant only at the 10 percent level 12 months later. From a targeting efficiency standpoint, these results seems to suggest that including beneficiaries younger than 22 years might require a different approach with respect to the enforcement of the demand-driven design, as lack of compliance to this institutional requirement is disproportionally observed within this demographic group.

Interestingly, the second panel of Tables 4A and 4B show that men benefit the same as women across all outcomes of interest. This important result goes contrary to what is observed in similar 'demand driven' experimental approaches implemented in other countries, particularly in Latin America such as Attanasio et al. (2011) for Colombia, Card et al. (2011) and Ibarrarán et al. (2015) for Dominican Republic, Alzúa et al. (2016) for Argentina, and Diaz and Rosas (2016) for Perú. All these studies show that young women benefit more from this type of vocational training initiatives than young men do.

While the Mongolian VTP was originally designed to target youngsters from poor households, Tables 4A and 4B also show that people that belong to the bottom quartile of the household asset index distribution benefit less from the program. The TOT parameters show statistically significant differential coefficients for employment (-37 percentage points), skills match (-23 percentage points) and self-employment (-17 percentage points) when comparing those at the bottom of the poverty index with

respect to those in the middle and upper end of the distribution. These sizable differential treatment effects hold 12 months later, although loss statistical significance for the employment and skills match outcomes. Monthly earnings for the poorest among the poor, on the other hand, and like the results observed across age cohorts, show negative differential effects six and twelve months after the intervention, although it is measured with statistical precision only in the latter case.

Finally, sizable heterogeneous effects emerge depending on the formal level of schooling for participants. Individuals with less than high school and individuals with completed high school show negative differential effects with respect to participants with tertiary or some college education. These differences are monotonic with respect to the 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 show the likelihood of employment is 54 and 74 percentage points lower for these individuals relative to those in the upper end of the schooling distribution six and twelve months after the intervention. For monthly earnings, the sizable negative magnitude of the coefficients holds over time.

Impacts by fields of training

Knowing whether the mean impacts vary according to the field of study could be important from a policy standpoint as it might signals the relevance of providing training in some fields relative to others. Table 5 provides intent-to-treat point estimates according to the vocational skills field of study. Rather than considering only one treatment indicator, we included in equation (1) multiple treatment variables according to the chosen field of study. Each one of these treatment indicators takes the value 1 if

refers to the specific "X" field of study, 0 otherwise. We consider the following categories: mechanical/machinery, hairdressing and beauty services, craftsmanship, agriculture and gardening, cooking and baking and other services, which together account for 90 percent of the total training slots. It is important to highlight these point estimates should be assessed with caution and only taken as suggestive evidence as sorting or self-selection of trainees in specifics fields of study can be driven by unobserved factors (e.g., personal traits), which in turn are correlated with the outcomes of interest in equation (1).

Results point out impact heterogeneity for the Mongolian VTP according to the chosen field of study in the short-run, although most of the parameters lack statistical precision. Mechanical/machinery and hairdressing and beauty services show positive and significant effects with the latter showing the largest impacts 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. However, these heterogeneous differences by field of study tend to dissipate 12 months later across all fields of study. Still, we can observe that 'hairdressing and beauty services' is the only field of study that shows positive and significant mean gains for the self-employment outcome 12 months after the intervention, while 'agriculture and gardening' and 'craftsmanship' show negative differential effects for earnings and self-employment outcomes.

Al in all, there is some suggestive evidence albeit weak that points out impact heterogeneity according to the chosen field of study. These differences are observed mainly in the short-run for particular fields of study and tend to dissipate one year later.

Information-Letter treatment

Conditional on attending the training courses, participants receive weekly letters with information about wage returns to vocational training. Random allocation was administered at the class level in order to avoid treatment contamination among peers. Out of the 410 trainees who attended 141 training courses, 291 were assigned to the information treatment group (101 courses) and 119 to the information control group (40 courses). Not all 291 individuals received the letters as some of them dropped from the program the first week of classes. Since the rate of no-shows is relatively low for this information-related treatment, we focus on the estimation of ITT treatment effects without making any formal distinction between ITT and TOT parameters. We assess five different outcomes of interest: days attended VTP, whether completed VTP, whether received VTP qualification (pass exam), whether received VTP certificate (formal graduation from program) and dropout rates. Since there is variation in the length of the courses, we assess the impacts of this information-related treatment at the extensive (whether received letter) and intensive (number of letters 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 'got VT vocational qualification' show sizable effects, although they lack statistical significance. When turning our attention to the intensive margin in the lower panel, statistically significant effects emerge for all outcomes of interest. On average, an extra letter handed to individuals assigned to the information treatment group is associate to 2.3 additional days of attending the course, higher probability of completing the course (6.9 pp), passing a formal test (8.5 pp),

getting a formal certificate (5 pp), and lower probability of dropping out (-7.7 pp). These results suggest that the repetition of the same message matters, a result that is in line with a relatively recent stream of the literature in development economics that provide analysis and insights about RCT interventions that use repetitive SMS messages to improve economic outcomes (e.g., health practices) in developing settings (e.g., Chong 2011).

Unlike the vocational training impacts that benefit more the relatively well-off young participants, this information-related intervention does not present statistical differences in the average gains across different demographic groups. As Table 7 reveals at the extensive (Panel A) and intensive (Panel B) margins, we do not observe statistically significant heterogeneous impacts by age, gender, level of schooling, and poverty status.

A related policy question of interest is whether the combination of vocational training with the provision of targeted information about the market returns to training leads to higher wages and employment. To test this idea, we interact the VT treatment status in equation (1) with the information-letter treatment assignment at both the extensive and intensive margins. Table 8 shows the point estimates for the interaction terms along with its standard errors. We do not observe statistical meaningful result as the estimated coefficients for the interaction terms are imprecisely measured across all outcomes of interest, six and 12 months after the intervention. Thus, although the information-related treatment is effective in extending the length of exposure to the vocational skills training program (at the intensive margin), this is not translated in improving the labor market outcomes of those receiving information relative to those who are deprived from this information.

7. Concluding Remarks

This study provides analysis and insights on the effectiveness of a demand driven vocational training program implemented in Ulaanbaatar, the city capital of Mongolia. The setting of this study is new to this literature, as we do not know much about the labor markets of this central Asian country that transitioned in a relatively short period 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 aims to counteract high levels of youth unemployment by responding to actual labor market needs through a mix of traditional, in-class courses with on-the-job (internships) training. In this sense, this paper provides evidence on the external validity of a market-based, training approach implemented with relatively success in other settings, particularly in Latin America.

The evaluation framework follows a randomized-control-trial that identifies average treatment effects under weak conditions. We implemented two independent random allocation developments, the first one to measure the labor market impacts of vocation training relative to no program at all, and the second one to measure the role of information on market returns to training on the length of exposure to vocational training within the sample of participants. This intervention is to the best of our knowledge the first labor-market RCT implemented in that part of the world.

One striking result that emerges from this study is the low take-up rate for this demand driven intervention. Around 42 percent of individuals randomly assigned to training do not attend the courses. The analysis of the determinants of take-up show that institutional constraints, notably the signature of 'quadrilateral' contracts that enforced internships prior to the start of the courses, as well as some demographic

variables (gender, education), and the chosen field of study, play an important role to explain this situation. In particular, the role of the signed 'quadrilateral contracts', which is at the core of demand driven approaches, cannot be understated as it seems to be the major barrier to scale up the operations for this training program.

Overall, we observe positive average impacts for this training intervention for monthly earnings, skills match and self-employment. These positive results are mainly observed in the short-run. Twelve months after the program ended, however, we only observe statistically significant impacts for monthly earnings and self-employment outcomes. Like other ALMP implemented worldwide, we also observe that not everyone benefits the same from the program, which highlights the importance of policy choices for targeting and training content design. In fact, substantive heterogeneous effects emerge as the relatively well-off, older and more educated benefit disproportionally more from this 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 implemented particularly in Latin America, we do not observe that this Mongolian vocational training has benefited more young women relative to young men. This is a solid result six and 12 months after the intervention.

As length of exposure to training is related to the overall efficiency of the program intervention, we randomly assigned the provision of weekly letters with information on market returns to vocational training to evaluate its impact on variables related to the (successful) completion of the vocational training treatment. In line with a new stream of literature on digital technologies (SMS messages) and economic outcomes in developing settings that highlight the role of framing and message repetition, we find that provision of information to young participants has positive

impacts on the length of exposure to training and the successful completion of training at the intensive margin. However, these positive information-related results do not lead to higher earnings or employment rates for participants.

.

References

Alzúa, M.L., Cruces, G. & Lopez, C., 2016. LONG-RUN EFFECTS OF YOUTH TRAINING PROGRAMS: EXPERIMENTAL EVIDENCE FROM ARGENTINA. *Economic Inquiry*, 54(4).

Attanasio, O., Kugler, A.D. & Meghir, C., 2011. Subsidizing vocational training for disadvantaged youth in developing countries: Evidence from a randomized trial. IZA Discussion Papers. *American Economic Journal: Applied Economics*, 3(July), pp.188–220. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract%7B_%7Did=1426738.

Card, D. et al., 2011. The Labor Market Impacts of Youth Training in the Dominican Republic. *Journal of Labor Economics*, 29(2), pp.267–300. Available at: http://www.journals.uchicago.edu/doi/10.1086/658090.

Card, D., Kluve, J. & Weber, A., 2010. Active Labour Market Policy Evaluations: A Meta-Analysis. *The Economic Journal*, 120(1976), pp.452–477. Available at: http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0297.2010.02387.x/full.

Cho, Y. et al., 2013. Gender Differences in the Effects of Vocational Training: Constraints on Women and Dropout Behavior. *World Bank Policy Research Working Paper*, (July).

Diaz, J.J. & Rosas, D., 2016. *Impact Evaluation of the Job Youth Training Program Projoven*,

Heckman, J. et al., 2000. Substitution and Dropout Bias in Social Experiments: A Study of an Influential Social Experiment. *The Quarterly Journal of Economics*, 115(2), pp.651–694. Available at: https://academic.oup.com/qje/article-lookup/doi/10.1162/003355300554764.

Hirshleifer, S. et al., 2016. The Impact of Vocational Training for the Unemployed: Experimental Evidence from Turkey. *Economic Journal*, 126(597), pp.2115–2146.

Ibarrarán, P., Ripani, L. & Ibarrarán, P., 2015. Experimental Evidence on the Long-Term Impacts of a Youth Training Program. *IZA Discussion Papers*, (9136).

Ibarrarán, P. & Rosas Shady, D., 2009. Evaluating the impact of job training programmes in Latin America: evidence from IDB funded operations. *Journal of Development Effectiveness*, 1(2), pp.195–216. Available at: http://www.tandfonline.com/doi/full/10.1080/19439340902918094.

International Labor Organization (ILO), 2017. *World Employment Social* 2018th ed. I. Geneva, ed., Geneva.

Jensen, R., 2010. The (Perceived) Returns to Education and the Demand for Schooling *. *Quarterly Journal of Economics*, 125(2), pp.515–548. Available at: https://academic.oup.com/qje/article-lookup/doi/10.1162/qjec.2010.125.2.515.

Mckenzie, D.J., 2017. How effective are active labor market policies in developing countries ? a critical review of recent evidence. , (March), pp.1–32. Available at: http://documents.worldbank.org/curated/en/256001490191438119/How-effective-are-active-labor-market-policies-in-developing-countries-a-critical-review-of-recent-evidence.

Pallais, A., 2014. Inefficient hiring in entry-level labor markets. *American Economic Review*, 104(11), pp.3565–3599.

Figure 1: Mongolia

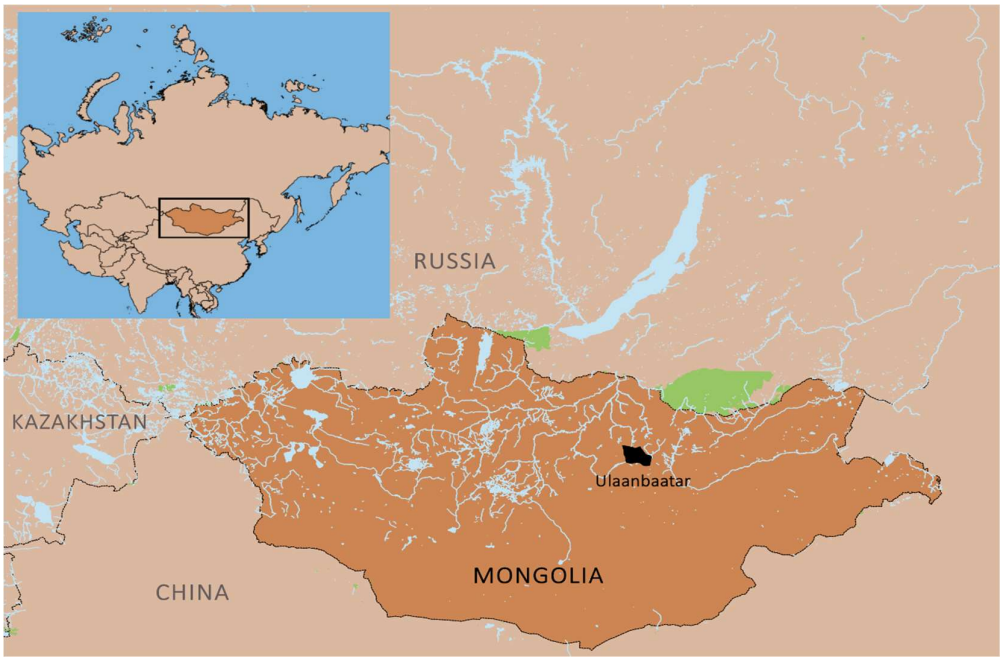

Figure 2: Timeline of the VT Intervention
Mongolian VT, 2014-2016

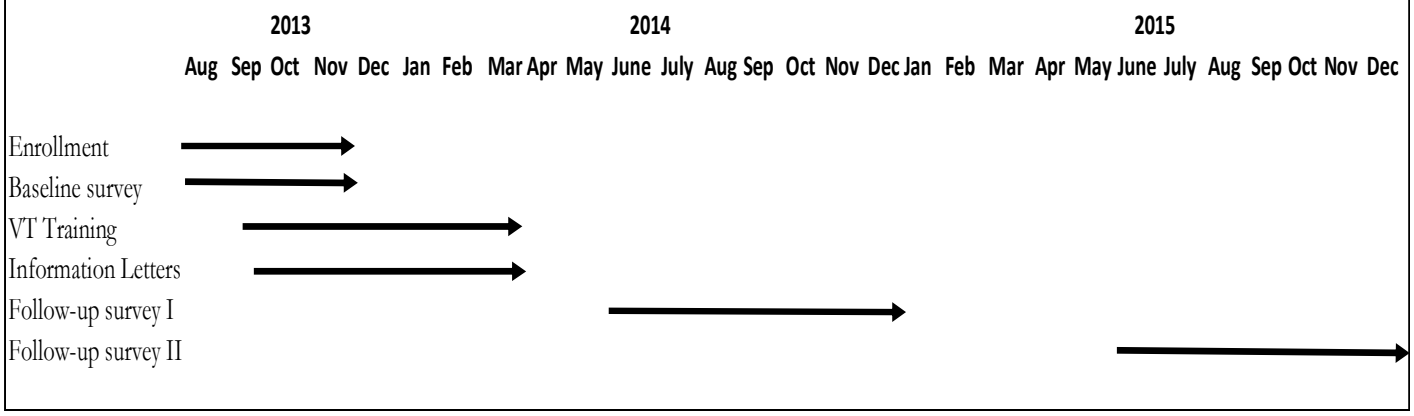

Table 1: Balancing Test Across Experimental Groups
Mongolian VT, 2014-2016

	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 (β_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 (β_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 (β_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 (β_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 (β_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 (β_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

continuation….

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.