



Jóvenes en Acción

SUBSIDIZING VOCATIONAL TRAINING FOR DISADVANTAGED YOUTH IN DEVELOPING COUNTRIES: EVIDENCE FROM A RANDOMIZED TRIAL

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BACKGROUND AND MOTIVATION

- ❑ Youth unemployment is exceptionally high in Latin America, with the youth unemployment rate tripling the adult rate.
- ❑ Unemployment in Latin America is even more of a problem for youth from poorer households, with youth unemployment rates reaching up to 50% among the poor in some countries.
- ❑ Moreover, the youth unemployment rate of those in the lowest income quartile is several times greater the rate of those in the highest quartile (9 times in Argentina, 5 times in Chile and 2 times in Colombia and Panama).

BACKGROUND AND MOTIVATION

- ❑ This is clearly a sad start to anyone's labor market experience and, given unemployment persistence, it is likely detrimental to the labor market prospects of these youth as adults.
- ❑ High youth unemployment may also induce young people to engage in criminal activities. In fact, youth crime has contributed to the recent overall rise in crime in Latin American.
- ❑ In addition to the usual concerns, youth unemployment may reduce living standards in Latin America, where young people are substantial contributors to household income.₃

BACKGROUND AND MOTIVATION

- ☐ Vocational training may be the best chance to improve the prospects of youth at the bottom of the income distribution who have already left the formal education system.
- ☐ As a by-product, training may also help to avoid undesirable social problems related to youth unemployment.
- ☐ However, while there may be good reasons to advocate the use of vocational training in developing countries, there is little reliable evidence on the impact of training on improving the labor market standing of the poor.

BACKGROUND AND MOTIVATION

- ❑ Careful evaluations of training programs in developed countries suggest positive effects of training for some demographic groups, but evidence on their cost-effectiveness is more mixed.
- ❑ At the same time, the levels of skills in less developed countries are much lower, so that one may expect the returns from training to be substantially higher.
- ❑ This paper evaluates a unique training program targeted to disadvantaged youth, “Jóvenes en Acción,” which was introduced in Colombia in the early 2000s.

BACKGROUND AND MOTIVATION

- ❑ A common problem with the evaluation of training programs is that it is often difficult to disentangle the causal effect of the program from:
 - self-selection of participants into the program,
 - selection by the program providers.
- ❑ The advantage of “Jóvenes en Acción” is that it randomly offered training to some individuals and not to others, allowing to capture the causal effect of training.

PREVIEW OF MAIN FINDINGS

- Because there is almost full compliance, we focus on Intention-to-Treat (ITT) effects, which are just comparisons between those offered and not offered training.
- The ITT effects show that being offered training increased the probability of employment of 0.04 and wage and salary earnings by 12%.
- Higher salaries are largely related to formal sector employment, since training increases the probability of having a formal sector job and a job with a written contract as well as formal salaries but not informal salaries.

OUTLINE

1. Description of the Program
2. Experimental Design
3. Data Collection and Description – Tables 1 & 2
4. Effects of Offers on Take-up – Table 3
5. Intention-to-Treat Effects on:
 - Overall Employment and Earnings – Table 4
 - Formal Employment and Earnings – Tables 5 & 6
 - Classroom vs. On-the-job Training – Table 7
6. Cost-Benefit Analysis
7. Conclusions

DESCRIPTION OF THE PROGRAM

- ❑ In the late 1990s, Colombia was hit by the hardest recession in 60 years. Given the absence of safety nets, in 2001 the Colombian government introduced 3 emergency programs to help those hit hardest by the crisis.
- ❑ These emergency social programs were:
 - Familias en Acción: a conditional cash-transfer program for rural families.
 - Empleo en Acción: a workfare-type employment program for urban adults.
 - Jóvenes en Acción: the training program for unemployed youth studied here.

DESCRIPTION OF THE PROGRAM

- “Jóvenes en Acción” reached 80,000 young people over four cohorts during the years 2002-2005. This paper analyzes the last cohort which randomized individuals into the program.
- The program targeted young people between the ages of 18 and 25 years of age, who were unemployed and whose families were in the lowest two deciles of the income distribution living in urban areas (i.e., the 7 largest cities of the country).

DESCRIPTION OF THE PROGRAM

- ❑ The training program consisted of 3 months of classroom and 3 months of on-the-job training.
- ❑ Classroom training was provided by training institutions, which had to be legally registered, had to show financial solvency and had to compete in a bidding process.
- ❑ In 2005, 114 training institutions offered 441 types of courses in 989 classes with 25,616 individuals.
- ❑ Of these training institutions, 43.2% were for profit and 56.8% were non-profit.

DESCRIPTION OF THE PROGRAM

- ☐ On-the-job training was provided by legally registered companies.
- ☐ Internships were offered mostly by companies in the manufacturing, retail and service sectors.
- ☐ During the entire 6 months, participants were given a stipend of \$2.20 per day, with the exception of women with children under 7 years of age who were given a stipend of \$3.00 per day to help cover for childcare expenses.

EXPERIMENTAL DESIGN

- ❑ As a rule earnings of trainees and non-trainees are not directly comparable for the reasons described above.
- ❑ Fortunately, random assignment allows us to overcome selection bias in the evaluation of Youth in Action.
- ❑ The randomization worked as follows:
 - Each class in each training institution provided a list of up to 50% more applicants than they had capacity for.
 - On January 18th, individuals in the list were randomly offered or not offered a position in a class at each training institution.

EXPERIMENTAL DESIGN - ISSUES

- ☐ If initially assigned individuals did not take up the slot, training institutions were allowed to fill slots with the next available individual in the randomly generated list.
- ☐ Also, individuals could request to be released from a list of a training institution and ask to be put in the list of another training institution.
- ☐ In practice, there was close to full compliance from the workers side. In our sample, only 0.18% of those offered training turned it down and only 1.29% of those put in the back-up lists got trained.

EXPERIMENTAL DESIGN - ISSUES

- ❑ Randomization occurred on January 18, but there were 17% of individuals assigned on February 1st, February 10th, April 29th, and May 6th, who were clearly not randomly assigned so we eliminate them. We also eliminate another 15% of individuals in institutions with more than 10% of non-randomly assigned individuals.
- ❑ Individuals were randomly assigned to each class, but we only have info. on type of course in each training institution. Thus, for institutions offering more than one class per type of course, we cannot exactly compare randomly selected treatment and controls.

DATA COLLECTION

- ❑ An initial proposed sample of 3,300 individuals was based on power tests that would provide significant differences between treatment and control individuals in terms of employment and earnings at the 10% significance level.
- ❑ Based on attrition rates of about 24% and 40% for the treatment and control groups, respectively, the proposed samples were increased to 2,040 and 2,310.

DATA COLLECTION

- ☐ The sample was stratified by city and sex, with equal numbers of men and women in each city.
- ☐ Eliminating the 33% of non-randomly assigned individuals leaves a sample of 2,859 individuals.
- ☐ Collection of information at baseline was conducted in January 2005, right before the beginning of the program.

DATA COLLECTION

- ☐ Collection of information in the first follow-up was conducted between August and October of 2006 or between 12 and 15 months after the completion of the program.
- ☐ Due to concerns about attrition, in November 2005, telephone interviews were carried out to update information on treatment and control individuals (about 85% were reached by phone).
- ☐ Personal visits were then arranged to update the information for the 15% who were not contacted by phone.

ATTRITION

- ❑ Among the initially randomly-assigned individuals in the baseline sample, there were 2,359 individuals or 82.2% in the follow-up sample.
- ❑ This is a remarkably low attrition rate, especially given that the sample includes young disadvantaged people in a low-income country.
- ❑ Moreover, attrition is only marginally related to random offers at the 10% level and women's attrition is unrelated to random offers at any level of significance.

DESCRIPTIVE STATISTICS

- ❑ Table 1 shows descriptive statistics:
 - Average age was 22 years of age.
 - Less than 19% married.
 - On average 10 years of education, i.e., HS dropouts.
 - Low employment rates and few days/month and hours/week worked.
 - Likely to have informal sector jobs.
 - Low earnings of US\$41/month or less than US\$2/day.

TABLE 1: DESCRIPTIVE STATISTICS BEFORE AND AFTER TREATMENT

	Pre-Treatment 2004	Post-Treatment 2006
Employment	0.496 (0.500)	0.736 (0.441)
Paid Employment	0.352 (0.478)	0.631 (0.483)
Contract (zero if out of work)	0.073 (0.260)	0.252 (0.435)
Formal (zero if out of work)	0.080 (0.271)	0.272 (0.445)
Wage and Salary Earnings (zero if out of work)	95,417 (150,513)	227,056 (209,526)
Self-employment Earnings (zero if missing)	22,019 (78,338)	21,374 (82,862)
Tenure (zero if out of work)	3.354 (8.164)	7.728 (13.741)
Days Worked per Month (zero if out of work)	11.919 (12.711)	17.382 (11.771)
Hours Worked per Week (zero if out of work)	24.957 (28.693)	38.078 (27.651)
Education	10.076 (1.806)	10.297 (1.660)
Age	21.188 (2.048)	22.764 (2.110)
Married	0.193 (0.395)	0.265 (0.442)
Max N	2,859	2,349

BASELINE BALANCE BETWEEN TREATMENT AND CONTROL

- ☐ If randomization was successful, baseline characteristics of those offered and not offered training should be fairly similar.
- ☐ Table 2 shows baseline differences between the treatment and control groups:
 - There are small differences in education, tenure and the share of women.
 - Controlling for course effects, only a difference of 15% of a standard deviation in education remains.

TABLE 2: BASELINE DIFFERENCES B/W TREATMENTS AND CONTROLS

	Pre-Training 2004 No Course Fixed Effects	Pre-Training 2004 Course Fixed Effects
Employment	0.001 (0.021)	-0.010 (0.021)
Paid Employment	0.024 (0.020)	0.018 (0.020)
Contract (0 if no work)	-0.000 (0.011)	0.001 (0.011)
Formal (0 if no work)	0.005 (0.011)	0.006 (0.011)
Wage and Salary Earnings (0 if no work)	850 (5,922)	-6,806 (6,000)
Self-employment Earnings (0 if missing)	-3,414 (3,394)	-3,002 (5,460)
Tenure (0 if no work)	0.942** (0.410)	0.768* (0.440)
Days Worked per Month (0 if no work)	0.188 (0.531)	-0.312 (0.535)
Hours Worked per Week (0 if no work)	-0.074 (1.185)	-1.436 (1.190)
Women	0.046** (0.018)	0.262 (0.174)
Education	0.257*** (0.083)	0.280*** (0.072)
Age	-0.113 (0.081)	-0.090 (0.085)
Married	-0.009 (0.019)	-0.015 (0.020)
Max N	2,858	2,269

ESTIMATING PROGRAM EFFECTS

- The effect of training is the difference in the average outcome for individuals in the treatment and control states:

$$\begin{aligned}\delta &= E\{Y_{1i} - Y_{0i} | D_i = 1\} \\ &= E\{Y_{1i} | D_i = 1\} - E\{Y_{0i} | D_i = 1\}.\end{aligned}$$

- Because of randomization within each class, the average outcome in each state can be identified by:

$$E\{Y_{1ti} | D_i = 1, C\} = E\{Y_{it} | D_i = 1, C, R_i = 1\}$$

$$E\{Y_{0ti} | D_i = 1, C\} = E\{Y_{it} | D_i = 1, C, R_i = 0\}.$$

ESTIMATING PROGRAM EFFECTS

- The difference between these two expectations is the program effect in class C:

$$\delta_C = E\{Y_{1i} - Y_{0i} | D_i = 1, C\} = E\{Y_i | D_i = 1, C, R_i = 1\} - E\{Y_i | D_i = 1, C, R_i = 0\}$$

- Our estimator of the intention-to-treat (ITT) effect is the weighted average of the within course effects:

$$\hat{\delta} = \frac{\sum_c P_c (1 - P_c) (\bar{Y}_{1c} - \bar{Y}_{0c})}{\sum_c P_c (1 - P_c)}$$

ESTIMATING PROGRAM EFFECTS

- Recognizing that this is a standard within-groups estimator, it is straight-forward to control for observables.
- Precision can be increased by controlling for pre-treatment characteristics, X_i . Also, including these helps to control for any remaining imbalances between treatment and control groups:

$$Y_{ij} = \delta R_i + \beta X_i + \psi_j + u_{ij}$$

EFFECTS OF RANDOM TRAINING OFFERS ON TRAINING

- Given full compliance, intention-to-treat (ITT) effects are essentially the average treatment effects of interest.
- The evidence presented above suggested close to full compliance in the Colombian experiment. To check for this, we estimate the following linear probability model:

$$T_{ij} = \alpha R_i + \rho X_i + \varphi_{jj} + u_i$$

TABLE 3: EFFECTS OF TRAINING OFFER ON TRAINING

	<u>(1)</u>	<u>(2)</u>
Training Offer	0.966*** (0.005)	0.965*** (0.005)
N	2,857	2,850
City Effects	Yes	Yes
Pre-treatment Characteristics	No	Yes
Course Fixed Effects	Yes	Yes

ITT EFFECTS ON EMPLOYMENT AND EARNINGS

- ☐ Table 4 report ITT effects on the employment and earnings.
- ☐ The results show that those offered training earn 12% more than those not offered training.
- ☐ Those offered training also have a 0.04 higher probability of getting paid employment.
- ☐ By contrast, the results show a reduction of about 1 month in tenure, which is about a third of the time spent in classroom training.

TABLE 4: ITT EFFECTS ON EARNINGS AND EMPLOYMENT

	Labor Supply					Earnings	
	<u>Employment</u>	<u>Paid Employment</u>	<u>Days/Month</u>	<u>Hours/Week</u>	<u>Tenure</u>	<u>Wage & Salary Earnings</u>	<u>Self-employment Earnings</u>
Control Means	0.723	0.603	16.903	37.472	8.781	209,017	23,260
A. Course Fixed Effects							
	0.023 (0.019)	0.048** (0.020)	0.789 (0.504)	1.077 (1.181)	-1.775*** (0.570)	32,554*** (8,622)	-2,317 (3,683)
N	2,348	2,348	2,348	2,348	2,335	2,348	2,348
B. Course Fixed Effects and Pre-treatment Characteristics							
	0.018 (0.018)	0.041** (0.020)	0.609 (0.49882)	0.738 (1.170)	-1.211*** (0.462)	25,475*** (8,555)	-2,283 (3,660)
N	2,342	2,342	2,342	2,342	2,161	2,432	2,342

ITT EFFECTS ON FORMAL SECTOR EMPLOYMENT

- ☐ Close to 50% of employment in Colombia in informal sector where there is no health insurance, pensions, or injury compensation.
- ☐ Table 5 reports ITT effects on formal sector employment and formal and informal salaries.
- ☐ Positive effect on probability of having a formal job with non-wage benefits and of having a written contract.
- ☐ Positive effect on formal salaries but not informal salaries, suggesting effect on earnings driven by increased access to formal sector.

TABLE 5: ITT EFFECTS ON FORMAL SECTOR EMPLOYMENT AND EARNINGS

	<u>Contract</u>	<u>Formal Employment</u>	<u>Formal Salary</u>	<u>Informal Salary</u>
Control Means	0.205	0.235	98381	110636
A. Course Fixed Effects				
	0.078*** (0.019)	0.063*** (0.019)	29,553*** (8,469)	59.607 (7,565)
N	2,348	2,348	2,348	2,348
B. Course Fixed Effects and Pre-training Characteristics				
	0.066*** (0.018)	0.053*** (0.019)	24,872*** (8,390)	603 (7,584)
N	2,342	2,342	2,342	2,342

GENDER DIFFERENCES

- ❑ The results on the ITT effects on labor market outcomes suggest bigger and more widespread effects of training on women.
- ❑ Why are effects bigger for women than men?
 - Women have less schooling so returns may be higher. But, no differential returns by education level.
 - Women get child care stipend, freeing up time and allowing them to enroll in longer courses. No difference in time spent in classroom.
 - Women more motivated and diligent in training. More men dropped out of program and more drops were due to having been expelled.

TABLE 6: ITT EFFECTS ON EMPLOYMENT AND EARNINGS FOR WOMEN AND MEN, SEPARATELY

	Women				Men			
	<u>Paid</u> <u>Employment</u>	<u>Formal</u> <u>Employment</u>	<u>Salary</u>	<u>Formal</u> <u>Salary</u>	<u>Employment</u>	<u>Formal</u> <u>Employment</u>	<u>Salary</u>	<u>Formal</u> <u>Salary</u>
Control Means	0.539	0.173	166,090	69,301	0.686	0.314	263,499	135,288
A. Course Fixed Effects								
	0.057** (0.029)	0.061** (0.025)	34,293*** (11,307)	26,292** (10,587)	0.012 (0.032)	0.040 (0.034)	4,548 (14,888)	20,790 (15,832)
N	1,281	1,281	1,281	1,281	1,067	1,067	1,067	1,067
B. Course Fixed Effects and Pre-training Characteristics								
	0.050* (0.029)	0.051** (0.025)	30,010*** (11,256)	22,106** (10,557)	0.010 (0.032)	0.037 (0.034)	4,155 (14,841)	19,486 (15,781)
N	1,278	1,278	1,278	1,278	1,064	1,064	1,064	1,064

CLASSROOM VS. ON-THE-JOB TRAINING

- ❑ Gain from offer of training is 12% in terms of earnings. This are at higher end of the gains found for Job Corps and JTPA in the U.S., which range between 4% and 12%.
- ❑ Why are returns high in Latin America? May be related to the findings in the U.S. showing that on-the-job training is more effective than classroom training.
- ❑ To examine this Table 7 report results of models which interact the offer dummy with hours of classroom and hours of on-the-job training in each site.

TABLE 7: EFFECTS WITH VARYING CLASSROOM TRAINING AND OJT DURATION

	<u>Paid</u> <u>Employment</u>	<u>Salary</u>	<u>Formal</u> <u>Employment</u>	<u>Formal</u> <u>Salary</u>
A. Interactions with Hours of Classroom Instruction				
Training Offer	0.112** (0.050)	52,616** (21,900)	0.079* (0.046)	39,241* (21,194)
Training Offer × Classroom Hours	-0.001 (0.001)	-382.213 (268.701)	-0.000 (0.001)	-193 (262)
N	2,107	2,107	2,107	2,107
B. Interactions with Hours of On-the-job Training				
Training Offer	-0.029 (0.041)	-8,463 (17,491)	-0.030 (0.038)	-16,249 (16,464)
Training Offer × OJT Hours	0.002** (0.001)	921** (421)	0.002** (0.001)	1,115*** (398)
N	2,342	2,342	2,342	2,342

CLASSROOM VS. ON-THE-JOB TRAINING

- ☐ Returns to training do not differ with the number of hours of classroom training at the site level.
- ☐ By contrast, returns to training much higher when duration of on-the-job training lengthens.
- ☐ Results suggest that it is the on-the-job component and not the classroom component of training that is effective. These results are in line with results for the U.S.

COST-BENEFIT ANALYSIS

- ❑ Simplest way to estimate a lower bound of benefits of training is to use the gains in earnings, i.e., around 25,500 CP/month or 306,000 CP/yearly.
- ❑ Consider two scenarios: one in which gains are permanent, and another one in which the gains from training depreciate at a rate of 10%.
- ❑ W/ discount rate of 5%, benefits of US\$2,327 w/ permanent gains, and benefits of US\$899.41 when gains depreciate.

COST-BENEFIT ANALYSIS

- ☐ The administrative cost of the program was US\$875 per person.
- ☐ Comparing lifetime benefits to these costs shows program was a great success without depreciation and cost-effective even under the second scenario, at least for women.
- ☐ Internal rates of return, which equate costs and benefits, are 14.5% with permanent gains, and 5.5% when allowing for depreciation.

CONCLUSIONS

- ❑ This paper evaluates an almost unique randomized training program in the context of a developing country.
- ❑ Results show large and significant effects of training on formal salaries and employment, which are mainly driven by women. On the other hand, tenure falls.
- ❑ Cost-benefit analysis indicates that the program was highly effective, which raises the question of there aren't more people training? Credit-constraints likely since training costs 22 months worth of salary.