JOB TRAINING AND FORMAL EDUCATION COMPLEMENTARITIES: EXPERIMENTAL EVIDENCE

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Bonn, June 5 2015

Motivation

- Job training programs (JTP) aim at improving employment prospects of individuals with difficulty integrating into economic mainstream.
- Such rationale assumes that in this population JTP are substitutes for formal education.
- JTP may complement formal education if they enable participants to learn about their ability or relax educational credit constraints.
  - Particularly in JTP that combine classroom training and subsidized private sector employment.

This paper

- We investigate the complementarity hypothesis in a randomized JTP for disadvantaged youth introduced in Colombia in 2005.

- We combine randomization data with national administrative education records.

- We examine complementarities in the medium and long-term, up to 10 years after initial assignment to training.

Preview of findings

- After JTP participation, lottery winners are 1.5 pp (28 percent) more likely to graduate from secondary school than losers.
- Winners are 3 pp (32 percent) more likely to enroll in formal tertiary education:
  - Men in universities.
  - Women in vocational colleges.
  - Strongest effects among applicants with above-average baseline schooling.
- Winners are also 2.6 pp (185 percent!) more likely to persist in tertiary education 4 years after initial enrollment.
  - Strongest effects among applicants with above-average baseline schooling.

Plan

1. Program background and prior evidence on short term impacts
2. Empirical strategy
3. Data
4. Results
5. Conclusions

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Program Background

- Colombia introduced JTP “Youth in Action” (YA) in 2002
  - Part of a broader safety net emergency strategy to cope with 2001 crisis.
- YA targeted poor unemployed urban youth (18-25).
- YA reached 80,000 beneficiaries over four cohorts between 2002-2005.
  - This paper analyzes the 2005 cohort which randomized individuals into the program.

Program Background

- YA consisted of 3 months of classroom and 3 months of on-the-job training (OJT).
- Training institutions selected through a competitive bidding process taught classroom modules.
  - Trainers' payments were conditional on participants' module completion.
- In 2005, 114 training institutions offered 441 courses in 989 classes with 25,616 individuals.
  - 43.2% for-profit, 56.8% non-profit.
- OJT internships were mostly in private manufacturing, retail and service companies.

Prior Evidence (Attanasio, Kugler, Meghir 2011)

- One year after the lottery, training offer increased the probability of paid employment by 7pp and earnings by 20 percent among women.
  - No short term labor market effects among men.

- Earnings increase among women:
  - 1/3 explained by increased access to formal jobs.
  - 2/3 explained by increased productivity and job matching.

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Empirical Strategy

- In 2005 cohort, slots in oversubscribed classes were assigned through lotteries.
  - 82% of applicants received training offer.
  - 98% compliance with lottery assignment.
- We do not observe class assignment, only course assignment.
  - If training institution offers two classes for seamstresses, we cannot compare treatment and control individuals within each class, but rather within each course, i.e., within the two seamstress classes.
- Analyses control for training institution fixed effects.
  - Robust to including training institution-by-course fixed effects.

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Data

- We combine three data sources:

1. Baseline data for a sample of 4,350 training applicants from 2005 cohort.
   - Sample selection stratified by treatment offer, city and gender.
2. National administrative secondary school completion exam records.
   - Years 2000-2012.
   - Use pre-2005 years as placebo tests.
3. National administrative tertiary education database.
   - Years 1998-2013.
   - Use pre-2005 years as placebo tests.

Randomization balance (2005 applicant sample)

	Control Mean (s.d)	Treated Mean (s.d)	Difference (s.e)
Female	0.54	0.53	0.01
	(0.50)	(0.50)	(0.02)
Age	21.24	21.05	0.19**
	(2.03)	(2.06)	(0.06)
Married	0.20	0.18	0.02
	(0.40)	(0.39)	(0.01)
Years of Education	9.93	10.17	-0.23***
	(1.96)	(1.68)	(0.06)
Employed	0.51	0.54	0.03
	(0.50)	(0.50)	(0.02)
Monthly wage and salary earnings (zero if out of work, COP$)	102,497	106,616	4,119
	(157,908)	(158,291)	(4,798)
Monthly self-employment earnings (zero if missing, COP$)	23,754	22,244	1,510
	(81,720)	(78,620)	(2,435)

Randomization balance (2005 applicant sample) cont.

	Control Mean (s.d)	Treated Mean (s.d)	Difference (s.e)
Formal (zero if out of work)	0.09	0.10	0.01
	(0.29)	(0.30)	(0.01)
Contract (zero if out of work)	0.09	0.08	0.01
	(0.29)	(0.28)	(0.01)
Job Tenure (Months)	3.22	4.06	-0.85**
	(7.69)	(9.97)	(0.28)
Days worked by month (zero if out of work)	12.19	12.80	(0.61)
	(12.67)	(12.73)	(0.39)
Hours worked by week (zero if out of work)	25.33	26.88	(1.44)
	(28.29)	(98.11)	(0.87)
Observations	2232	2115	

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   - Secondary school completion
   - Tertiary education access
   - Tertiary education persistence
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Secondary School Completion

	Completed Secondary School after...			
	2006	2007	2008	2009
Treated	0.014*	0.008	0.007	0.006
	(0.007)	(0.006)	(0.006)	(0.005)
Control Mean	0.052	0.041	0.034	0.027
Treated	0.009	0.003	0.005	0.003
	(0.010)	(0.009)	(0.009)	(0.008)
Control mean	0.045	0.039	0.032	0.026
Treated	0.015	0.009	0.006	0.005
	(0.010)	(0.009)	(0.008)	(0.007)
Control mean	0.058	0.043	0.036	0.027

Tertiary Education Access

	Initial Enrollment After YA (2006 and after)	Initial Enrollment in 2006	Initial Enrollment in 2007	Initial Enrollment in 2008	Initial Enrollment in 2009
	A. Full Sample				
Treated	0.035***	0.008*	0.012**	0.003	0.004
	(0.011)	(0.005)	(0.005)	(0.004)	(0.004)
Control Mean	0.110	0.017	0.015	0.013	0.014
	B. Applicants with prior education above mean				
Treated	0.039***	0.010	0.016**	0.000	0.006
	(0.014)	(0.006)	(0.006)	(0.005)	(0.004)
Control mean	0.142	0.021	0.020	0.017	0.020
	C. Applicants with prior education below mean				
Treated	0.021	0.005	0.003	0.009	0.004
	(0.014)	(0.005)	(0.006)	(0.006)	(0.004)
Control mean	0.040	0.006	0.006	0.004	0.001

Tertiary Education Access

	Enrolled in University	Enrolled in Vocational College	Enrolled in University	Enrolled in Vocational College	Enrolled in University	Enrolled in Vocational College
	Full Sample		Male		Female	
Treated	0.025**	0.010*	0.043**	(0.002)	0.011	0.020***
	(0.011)	(0.005)	(0.017)	(0.009)	(0.014)	(0.007)
Control Mean	0.110	0.024	0.116	0.035	0.105	0.015

	Full Sample		Applicants with prior education above mean		Applicants with prior education below mean	
Treated	0.025**	0.010*	0.032**	0.012*	0.007	0.008
	(0.011)	(0.005)	(0.014)	(0.007)	(0.014)	(0.007)
Control Mean	0.110	0.024	0.139	0.032	0.046	0.007

Tertiary Education Persistence

		Continued Enrollment in Tertiary Education X years after training				
		One year	Two years	Three years	Four years	Five years
Full Sample	Treated	0.034***	0.028***	0.025**	0.026***	0.016*
		(0.011)	(0.011)	(0.010)	(0.009)	(0.009)
	Control mean	0.017	0.015	0.013	0.014	0.015
Male	Treated	0.043**	0.030*	0.031*	0.029*	0.013
		(0.018)	(0.017)	(0.016)	(0.015)	(0.014)
	Control mean	0.021	0.014	0.016	0.019	0.020
Female	Treated	0.027*	0.026*	0.022*	0.023*	0.017
		(0.015)	(0.014)	(0.013)	(0.012)	(0.011)
	Control mean	0.012	0.017	0.011	0.011	0.012
Applicants with prior education above mean	Treated	0.043***	0.033**	0.032**	0.033***	0.024**
		(0.014)	(0.014)	(0.013)	(0.012)	(0.011)
	Control mean	0.053	0.052	0.046	0.041	0.034
Applicants with prior education below mean	Treated	0.009	0.010	0.002	0.003	-0.008
		(0.015)	(0.014)	(0.013)	(0.012)	(0.011)
	Control mean	0.171	0.158	0.146	0.124	0.105

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Conclusions

- In the Colombian context, JTP complement formal education, providing an avenue for social mobility.
- Complementarity among men could be due to:
  - Ability learning.
  - Improved skills through training.
- Complementarity among women also due to:
  - Increased expected returns to a vocational college degree given that female lottery winners experience earlier rise in formal employment.
  - Relaxation of credit constraints due to higher earnings immediately after training.

Conclusions

- Welfare calculations of JTP based on short-term employment and earnings impacts alone may underestimate social desirability of these kinds of programs.
  - e.g. 15-20% (Mincerian) return to an additional year of tertiary education.