Online Appendix

The Lasting Effects of Working while in School: A Long-Term Follow-Up

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The Online Appendix includes five sections. Section A contains additional tables and figures. Section B assesses the robustness of our main results. Section C presents robustness checks on the cost-benefit analysis. Section D provides further details about the work-study program. Section E presents our back-of-the-envelope computation of the contribution of the education and experience channels.

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A Additional Tables and Figures

Table A1: Main Features of the Program by Edition

Edition	1	2	3
Application Date	May 2012	May 2013	May 2014
Applications	46,544	43,661	31,990
Applicants	46,008	42,643	30,969
Job Offers Made	754	981	955
Jobs Started	592	754	718
Jobs Completed	549	686	660
Sector: Civil	0.82	0.73	0.70
Sector: Industry/Trade	0.02	0.04	0.04
Sector: Banking	0.16	0.23	0.26
Localities	51	64	67

Source: Administrative data and YET Application Form.
Notes: There is a downward trend in applications over time, probably due to the program spending more resources on advertising in the first two editions, and due to longer lottery registration time windows in the first two editions. However, we do not see any notable trend in applicants' characteristics over time.

Table A2: Balance Between Treatment and Control Groups

	(1)	(2)	(3)	(4)	(5)
	Control		Offered		
	Mean	S.D.	Mean	S.D.	p-value
Panel A. Demographic					
Female	0.58	0.49	0.60	0.49	0.15
Aged 16-18	0.71	0.45	0.72	0.45	0.88
Aged 19-20	0.29	0.45	0.28	0.45	0.88
Montevideo (Capital City)	0.49	0.50	0.55	0.50	.
Panel B. Education and Social Programs Year -1					
Enrolled in Academic Secondary Education	0.49	0.50	0.48	0.50	0.51
Enrolled in Technical Secondary Education	0.22	0.41	0.22	0.42	0.56
Enrolled in University	0.15	0.36	0.16	0.36	0.32
Enrolled in Tertiary Non-University	0.01	0.11	0.01	0.10	0.68
Enrolled in Out-of-School Programs	0.02	0.14	0.02	0.14	0.54
Highly Vulnerable HH (Food Card Recipient)	0.10	0.30	0.09	0.29	0.25
Vulnerable Household (CCT recipient)	0.27	0.45	0.27	0.44	0.72
Panel C. Labor Outcomes Year -1					
Earnings (winsorized top 1%, USD)	228.13	800.69	200.21	757.38	0.20
Positive Earnings	0.15	0.36	0.15	0.35	0.84
Months with Positive Earnings	0.71	2.13	0.62	1.97	0.12
Months with Regular Job	0.41	1.63	0.36	1.49	0.09
Panel D. Aggregate orthogonality test for panels A-C p-value (joint F-test)					0.54
Observations	87,737		2,686		90,423

Source: Administrative data and YET Application Form.
Notes: The p-value reported in Column 5 is obtained from a regression of each variable on a YET job offer dummy with robust standard errors, controlling for lottery design (lottery and quota dummies) and number of applications. We do not test for differences in means for Montevideo since the lottery was randomized within each locality and we control for lottery design in all our specifications. Vulnerable households include households receiving a cash transfer and/or a food card (labelled as *Highly Vulnerable*). We code Enrolled in University by using two indicators available in the administrative data: "entering a new program that year" or "taking at least two exams that year", for the first edition we do not have data on Year -1 and we use the value as self-reported by participants in the application form. p-value (joint F-test): corresponds to the orthogonality test in a regression of the YET job offer dummy on covariates; the regression also controls for lottery design and number of applications (coefficients not included in the F-test).

Table A3: Effect of YET Offer on YET Participation (First Stage)

	(1)	(2)	(3)	(4)
		YET Participation		
	All Editions	Edition 1	Edition 2	Edition 3
Won Lottery	0.77	0.79	0.77	0.77
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	90,423	36,181	30,410	23,832

Source: Administrative data and YET Application Form.
Notes: OLS regressions of YET participation in Year 0 on the offer to take the YET job (winning the lottery). Controls for lottery design (lottery and quota dummies) and number of applications are included. Covariates include gender, a dummy for age 18 or less at application, a dummy for receiving cash transfers, baseline earnings and dummies for baseline education type. Robust standard errors shown in parenthesis. Results for the first edition are obtained with the same method used to select unique applications as in the other editions. Results are almost identical if we keep the first application.

Table A4: Returns to Having a Regular Job. Control Group

	(1) Total earnings
Program year	
Year 0	428.25
	(1.79)
	[462.39]
Post-Program years	
Year 1	459.73
	(1.82)
	[892.37]
Year 2	494.76
	(1.97)
	[1238.76]
Year 3	533.06
	(2.14)
	[1511.34]
Year 4	579.65
	(2.36)
	[1760.67]
Year 5	626.53
	(2.57)
	[1852.16]
Year 6	666.95
	(2.77)
	[1893.23]
Year 7	697.54
	(2.98)
	[1993.21]
Observations	87,737

Source: Administrative data and YET Application Form.
Notes: The independent variable is defined as number of months with a regular contract. Covariates include gender, a dummy for age 18 or less at application, a dummy for receiving cash transfers, baseline earnings and dummies for baseline education type. Robust standard errors shown in parenthesis and control means in brackets.

Table A5: Effect of YET on Enrollment in Education

	(1) Any Level	(2) Secondary Programs	(3) University	(4) Tertiary Non-Univ.
Program year				
Year 0	0.126	0.102	0.018	0.007
	(0.009)	(0.010)	(0.007)	(0.004)
	[0.731]	[0.500]	[0.203]	[0.017]
Post-Program years				
Year 1	0.037	0.030	0.011	0.003
	(0.012)	(0.011)	(0.009)	(0.004)
	[0.608]	[0.321]	[0.265]	[0.022]
Year 2	0.041	0.024	0.009	0.008
	(0.012)	(0.010)	(0.009)	(0.004)
	[0.452]	[0.225]	[0.205]	[0.025]
Year 3	0.033	0.025	0.004	0.003
	(0.011)	(0.009)	(0.008)	(0.004)
	[0.277]	[0.141]	[0.122]	[0.026]
Year 4	0.015	0.011	0.004	0.004
	(0.009)	(0.007)	(0.006)	(0.004)
	[0.145]	[0.085]	[0.052]	[0.025]
Year 5	0.005	0.008	-0.002	0.004
	(0.008)	(0.006)	(0.005)	(0.004)
	[0.104]	[0.055]	[0.049]	[0.021]
Year 6	0.003	-0.003	0.007	0.001
	(0.007)	(0.005)	(0.005)	(0.003)
	[0.085]	[0.044]	[0.042]	[0.016]
Year 7	0.010	0.005	0.005	0.005
	(0.007)	(0.005)	(0.005)	(0.004)
	[0.073]	[0.037]	[0.036]	[0.015]
Observations	90,423	90,423	90,423	90,423

Source: Administrative data and YET Application Form.
Notes: Two-stage least squares regressions where we instrument the YET participation dummy with a job offer dummy. Controls for lottery design (lottery and quota dummies) and number of applications are included. Covariates include gender, a dummy for age 18 or less at application, a dummy for receiving cash transfers, baseline earnings, and dummies for baseline education type. We code "registered at university" by using two indicators available in the administrative data: "entering a new program that year" or "taking at least two exams that year". For 2017, we do not have data on students taking two exams, and therefore the mean of university registration is underestimated (this applies to Year 4 for edition 1, Year 3 for edition 2, and Year 2 for edition 3). In Column (4), "Tertiary Non-Univ." is enrollment in tertiary technical schools. Standard errors robust to heteroskedasticity shown in parentheses, and control complier means in brackets.

Table A6: Treatment Effect Heterogeneity by Gender

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Post-Program years					
Years 3–7					
Treated (T)	889.80	0.35	0.02	70.88	0.71
	(218.28)	(0.17)	(0.01)	(16.63)	(0.19)
T * Female	-542.84	-0.09	-0.01	-49.53	-0.29
	(258.31)	(0.22)	(0.02)	(19.73)	(0.23)
Female	-903.60	-0.38	-0.03	-83.45	0.17
	(30.94)	(0.03)	(0.00)	(2.41)	(0.03)
CCM Male	[5140.69]	[6.96]	[0.74]	[630.79]	[5.03]
CCM Female	[4418.18]	[6.64]	[0.72]	[565.95]	[5.38]
p-value T+T*Female=0	0.01	0.05	0.17	0.04	0.00
Observations	90,423	90,423	90,423	81,217	90,423

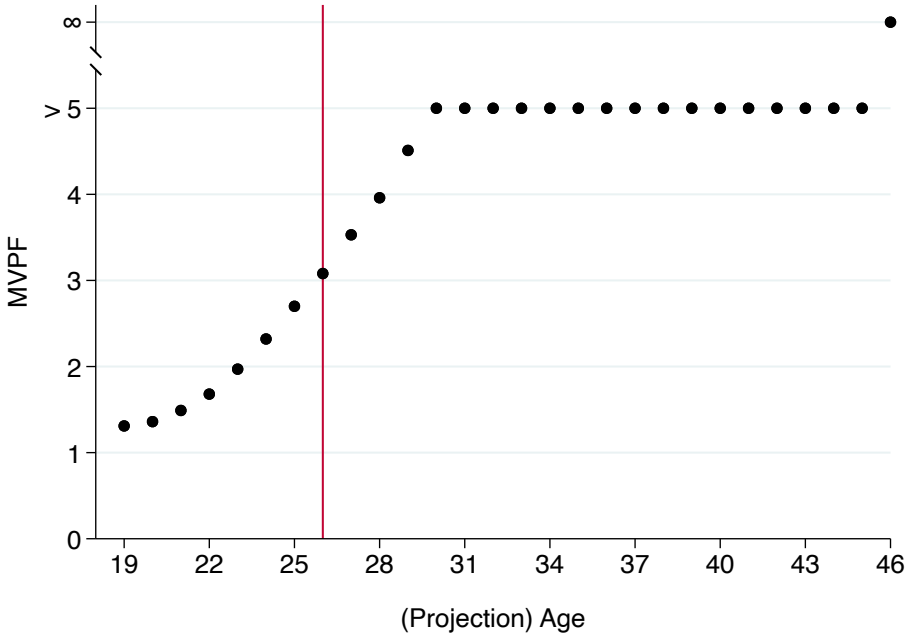
Source: Administrative data and YET Application Form.
Notes: Two stage least squares regressions where we instrument the YET participation dummy, and its interaction with a female dummy with a job offer dummy and the corresponding interaction. Controls for lottery design (lottery and quota dummies) are included. Covariates include gender, a dummy for age 18 or less at application, a dummy for receiving cash transfers, baseline earnings and dummies for baseline education type. Robust standard errors shown in parenthesis. p-value: p-value of the test that the treatment effect for females is zero (sum of the treated and interaction coefficients).

Table A7: Treatment Effect Heterogeneity by Household Vulnerability

	(1)	(2)	(3)	(4)
	Program Year	**Post-Program years**		
	Year 0	Year 1	Year 2	Years 3-7
Treated (T)	2074.53	56.81	166.59	502.74
	(49.46)	(90.12)	(111.69)	(144.58)
T * Vulnerable	311.54	134.02	194.62	202.78
	(91.08)	(160.79)	(203.41)	(253.40)
Vulnerable	-120.81	-124.06	-271.02	-820.49
	(14.60)	(20.76)	(25.21)	(31.03)
CCM Non-Vulnerable	[1223.60]	[2190.00]	[3057.78]	[5050.76]
CCM Vulnerable	[917.65]	[1766.47]	[2374.90]	[3739.71]
p-value T+T*Vulnerable=0	0.00	0.15	0.03	0.00
Observations	90,423	90,423	90,423	90,423

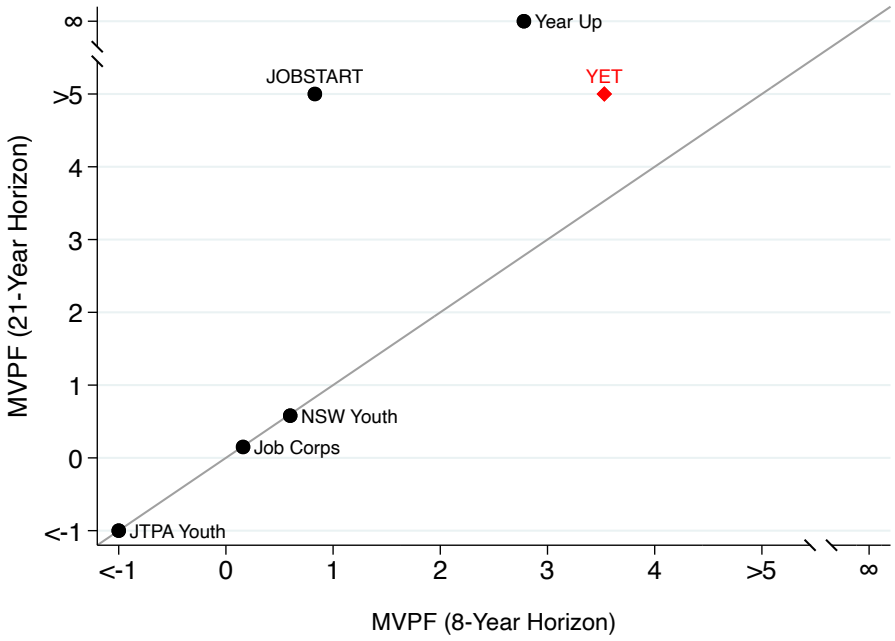
Source: Administrative data and YET Application Form.
Notes: Two stage least squares regressions where we instrument the YET participation dummy, and its interaction with a vulnerability dummy with a job offer dummy and the corresponding interaction. The dependent variable is total earnings. Vulnerable households include households receiving a cash transfer. Controls for lottery design (lottery and quota dummies) are included. Covariates include gender, a dummy for age 18 or less at application, a dummy for receiving cash transfers, baseline earnings and dummies for baseline education type. Robust standard errors shown in parenthesis. p-value: p-value of the test that the treatment effect for individuals in vulnerable households is zero (sum of the treated and interaction coefficients).

Figure A1: MVPF Over the Life Cycle



Source: Administrative and household survey data.
Notes: This figure plots the MVPF by age. The vertical line indicates the last age for which the MVPF is based on observed data.

Figure A2: MVPF for YET and Job Training Programs. 8– and 21–year Horizon



Source: Authors' calculations based on administrative and household survey data, and estimates from Hendren and Sprung-Keyser (2020b).
Notes: This figure plots the MVPF at 21 years after the programs against the MVPF 8 years after the programs. The black circles represent job training programs, based on Table C.I of the Online Appendix in Hendren and Sprung-Keyser (2020b). The 8-year estimate for Job Corps is our own calculation based on the study's replication file (Hendren and Sprung-Keyser, 2020a). The red diamond represents estimates for YET, the program we study.

B Robustness Checks on Labor Market Results

In this section, we test the robustness of our main results to alternative specifications. Specifically, we show that our main results in Table 1 are robust to omitting controls (see Table B1), clustering the standard errors at the locality level (see Table B2), and not winsorizing the earnings variables (see Table B3).

Additionally, we provide intention-to-treat estimates (ITT) that do not rely on the exclusion restriction, and we obtain consistent results (see Table B4). We also explore an alternative definition of treatment that allows us to estimate a parameter that may be closer to the effect of working while in school, but relies on stronger assumptions. Under this alternative specification, we define treatment as working in any firm while being enrolled in school during the program year. Results are even stronger, and overall consistent with our main estimates (see Table B5). This alternative specification assumes that the *type* of in-school job has no effect on future labor and educational outcomes. In particular, it assumes that there are similar effects of program jobs and of the potential control jobs students would have accepted if they had not been offered a program job. Since program jobs are well-paid temporary jobs, we see this alternative specification as less appropriate.

We assess the robustness of our handling of youth with multiple applications in Tables B6, B7, and B8. In Table B6, we control for the number of applications within an edition-year using fixed effects instead of a linear form. In Table B7, we restrict the estimation sample to applicants who apply to only one edition-year. In Table B8, we run the specification at the application level, clustering standard errors at the applicant level.

Finally, we provide bounds for the ITT effects on monthly wages to account for selection into employment (see Table B9).

Table B1: Effect of YET on Labor Outcomes. No controls

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Program year					
Year 0	2137.31	6.83	0.56	-32.26	7.62
	(45.12)	(0.08)	(0.01)	(3.18)	(0.07)
	[1162.33]	[2.76]	[0.44]	[372.70]	[1.81]
Post-Program years					
Year 1	70.89	-0.02	0.05	3.26	0.41
	(78.11)	(0.12)	(0.01)	(7.77)	(0.11)
	[2097.95]	[4.38]	[0.58]	[426.09]	[3.02]
Year 2	200.06	0.03	0.02	22.63	0.35
	(96.60)	(0.13)	(0.01)	(8.80)	(0.13)
	[2892.83]	[5.36]	[0.65]	[484.47]	[3.85]
Year 3	327.46	0.15	0.01	32.76	0.37
	(111.77)	(0.13)	(0.01)	(9.56)	(0.13)
	[3561.50]	[6.00]	[0.69]	[536.37]	[4.42]
Year 4	503.80	0.33	0.03	37.31	0.57
	(128.16)	(0.13)	(0.01)	(10.86)	(0.14)
	[4304.19]	[6.56]	[0.71]	[597.58]	[4.98]
Year 5	607.17	0.32	0.02	45.17	0.63
	(141.89)	(0.13)	(0.01)	(11.92)	(0.14)
	[4703.47]	[6.74]	[0.73]	[637.44]	[5.24]
Year 6	672.52	0.36	0.01	59.44	0.57
	(154.72)	(0.13)	(0.01)	(13.20)	(0.14)
	[5181.34]	[7.06]	[0.75]	[668.05]	[5.59]
Year 7	660.41	0.31	0.02	44.56	0.61
	(167.31)	(0.13)	(0.01)	(14.16)	(0.14)
	[5753.44]	[7.45]	[0.76]	[708.05]	[5.91]
Observations	90,423	90,423	90,423	67,793	90,423

Source: Administrative data and YET Application Form.
Notes: Replicates Table 1 without including individual control variables. Controls for lottery design (lottery and quota dummies) are included.

Table B2: Effect of YET on Labor Outcomes. Clustering at Locality Level

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Program year					
Year 0	2158.36	6.86	0.56	-20.14	7.64
	(186.61)	(0.36)	(0.04)	(8.84)	(0.26)
	[1141.28]	[2.73]	[0.44]	[360.58]	[1.80]
Post-Program years					
Year 1	92.87	0.01	0.05	7.64	0.42
	(79.49)	(0.13)	(0.01)	(5.80)	(0.09)
	[2075.98]	[4.35]	[0.58]	[421.70]	[3.01]
Year 2	218.96	0.05	0.02	25.65	0.35
	(65.79)	(0.09)	(0.01)	(7.07)	(0.08)
	[2873.93]	[5.35]	[0.65]	[481.45]	[3.85]
Year 3	341.43	0.16	0.01	34.59	0.36
	(78.69)	(0.12)	(0.01)	(5.21)	(0.12)
	[3547.53]	[6.00]	[0.69]	[534.54]	[4.42]
Year 4	512.31	0.33	0.03	38.31	0.55
	(120.05)	(0.13)	(0.01)	(8.80)	(0.17)
	[4295.68]	[6.56]	[0.71]	[596.57]	[4.99]
Year 5	610.84	0.32	0.02	45.90	0.61
	(88.21)	(0.08)	(0.01)	(7.35)	(0.09)
	[4699.80]	[6.74]	[0.73]	[636.71]	[5.25]
Year 6	669.94	0.36	0.01	57.77	0.55
	(111.67)	(0.12)	(0.01)	(8.08)	(0.10)
	[5183.92]	[7.06]	[0.75]	[669.72]	[5.61]
Year 7	652.00	0.31	0.02	43.71	0.58
	(116.75)	(0.14)	(0.01)	(7.96)	(0.09)
	[5761.85]	[7.46]	[0.76]	[708.89]	[5.93]
Observations	90,423	90,423	90,423	67,793	90,423

Source: Administrative data and YET Application Form.
Notes: Replicates Table 1, but clustering the standard errors at the locality level.

Table B3: Effect of YET on Labor Outcomes. No Winsoring

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Program year					
Year 0	2157.97	6.86	0.56	-20.68	7.63
	(43.53)	(0.08)	(0.01)	(3.34)	(0.07)
	[1153.62]	[2.74]	[0.44]	[362.12]	[1.80]
Post-Program years					
Year 1	116.16	0.01	0.05	10.69	0.42
	(79.18)	(0.12)	(0.01)	(8.04)	(0.11)
	[2087.92]	[4.35]	[0.58]	[423.34]	[3.01]
Year 2	252.09	0.05	0.02	29.63	0.35
	(99.32)	(0.13)	(0.01)	(9.24)	(0.12)
	[2890.35]	[5.35]	[0.65]	[483.65]	[3.85]
Year 3	377.10	0.16	0.01	38.87	0.36
	(114.09)	(0.13)	(0.01)	(9.96)	(0.13)
	[3556.65]	[6.00]	[0.69]	[535.61]	[4.43]
Year 4	555.88	0.33	0.03	43.53	0.55
	(130.75)	(0.13)	(0.01)	(11.48)	(0.13)
	[4294.38]	[6.56]	[0.71]	[596.20]	[4.99]
Year 5	679.03	0.32	0.02	53.38	0.61
	(147.25)	(0.13)	(0.01)	(12.80)	(0.13)
	[4693.68]	[6.74]	[0.73]	[636.16]	[5.25]
Year 6	735.40	0.36	0.01	64.94	0.55
	(159.02)	(0.13)	(0.01)	(13.97)	(0.14)
	[5177.61]	[7.06]	[0.75]	[669.12]	[5.61]
Year 7	720.48	0.31	0.02	50.82	0.58
	(173.79)	(0.13)	(0.01)	(15.14)	(0.14)
	[5755.39]	[7.46]	[0.76]	[708.37]	[5.93]
Observations	90,423	90,423	90,423	67,793	90,423

Source: Administrative data and YET Application Form.
Notes: Replicates Table 1, without winsorizing the dependent variables used in Column (1) and Column (4).

Table B4: Effect of YET on Labor Outcomes. ITT Effects

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Program year					
Year 0	1669.87	5.31	0.44	-17.32	5.91
	(36.11)	(0.08)	(0.01)	(2.72)	(0.08)
	[1321.06]	[3.07]	[0.46]	[380.18]	[2.06]
Post-Program years					
Year 1	71.85	0.01	0.04	5.88	0.33
	(58.22)	(0.09)	(0.01)	(5.77)	(0.09)
	[2260.56]	[4.57]	[0.60]	[438.53]	[3.20]
Year 2	169.41	0.04	0.02	19.74	0.27
	(72.66)	(0.10)	(0.01)	(6.54)	(0.10)
	[3005.40]	[5.42]	[0.66]	[495.25]	[3.93]
Year 3	264.16	0.13	0.01	26.92	0.28
	(83.92)	(0.10)	(0.01)	(7.14)	(0.10)
	[3684.42]	[6.03]	[0.69]	[550.99]	[4.50]
Year 4	396.36	0.26	0.02	29.88	0.43
	(95.76)	(0.10)	(0.01)	(8.13)	(0.10)
	[4406.61]	[6.53]	[0.71]	[611.72]	[4.99]
Year 5	472.60	0.25	0.01	36.12	0.47
	(106.00)	(0.10)	(0.01)	(8.99)	(0.10)
	[4868.15]	[6.73]	[0.72]	[657.42]	[5.24]
Year 6	518.32	0.28	0.01	45.45	0.43
	(115.16)	(0.10)	(0.01)	(9.92)	(0.11)
	[5312.69]	[6.97]	[0.74]	[692.67]	[5.51]
Year 7	504.44	0.24	0.02	34.25	0.45
	(123.86)	(0.10)	(0.01)	(10.53)	(0.11)
	[5766.69]	[7.24]	[0.75]	[725.81]	[5.77]
Observations	90,423	90,423	90,423	67,793	90,423

Source: Administrative data and YET Application Form.
Notes: Replicates Table 1, but presents ITT effects rather than ToT effects. Control means are presented in brackets.

Table B5: Effect of Working and Studying During Program Year

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Program year					
Year 0	3755.89	11.94	0.98	-93.10	13.29
	(84.89)	(0.20)	(0.02)	(14.98)	(0.22)
	[-53.72]	[-0.56]	[0.02]	[360.43]	[-1.06]
Post-Program years					
Year 1	161.60	0.01	0.09	17.34	0.73
	(130.49)	(0.20)	(0.02)	(16.97)	(0.19)
	[1310.17]	[2.90]	[0.43]	[393.53]	[1.87]
Year 2	381.03	0.09	0.04	50.80	0.61
	(162.63)	(0.22)	(0.02)	(16.81)	(0.22)
	[2205.16]	[4.43]	[0.57]	[443.16]	[3.10]
Year 3	594.14	0.28	0.02	65.96	0.64
	(188.03)	(0.23)	(0.02)	(17.53)	(0.23)
	[2816.54]	[5.18]	[0.62]	[485.90]	[3.69]
Year 4	891.50	0.58	0.05	71.61	0.97
	(214.57)	(0.22)	(0.02)	(19.50)	(0.23)
	[3550.28]	[5.88]	[0.66]	[549.77]	[4.28]
Year 5	1062.97	0.57	0.03	84.23	1.06
	(237.74)	(0.22)	(0.02)	(21.02)	(0.23)
	[3911.72]	[6.15]	[0.68]	[581.59]	[4.62]
Year 6	1165.81	0.62	0.01	105.11	0.97
	(258.65)	(0.23)	(0.02)	(23.05)	(0.24)
	[4342.15]	[6.56]	[0.71]	[604.72]	[5.03]
Year 7	1134.59	0.54	0.04	78.58	1.02
	(277.91)	(0.22)	(0.02)	(24.17)	(0.24)
	[5151.49]	[7.16]	[0.74]	[659.37]	[5.48]
Observations	90,423	90,423	90,423	67,793	90,423

Source: Administrative data and YET Application Form.
Notes: Two stage least squares regressions where we instrument a dummy variable taking the value of one if youth work (positive yearly earnings) and study (enrolled at any level) during the program year with the offer to take the YET job. Controls for lottery design (lottery and quota dummies) are included. Covariates include gender, a dummy for age 18 or less at application, a dummy for receiving cash transfers, baseline earnings and dummies for baseline education type. Robust standard errors shown in parenthesis and control complier means in brackets. The control complier mean is obtained as the difference between the average outcome for compliers offered a YET job and the estimated local average treatment effect. To recover the former from the data we assume that the average outcome for and the share of always takers are the same among those offered and not offered a YET job.

Table B6: Effect of YET on Labor Outcomes (with Number of Applications Fixed Effects)

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Program year					
Year 0	2160.26	6.86	0.56	-19.94	7.64
	(41.72)	(0.08)	(0.01)	(3.16)	(0.07)
	[1139.38]	[2.73]	[0.44]	[360.38]	[1.79]
Post-Program years					
Year 1	95.14	0.01	0.05	8.05	0.42
	(75.19)	(0.12)	(0.01)	(7.48)	(0.11)
	[2073.71]	[4.35]	[0.58]	[421.29]	[3.01]
Year 2	220.83	0.05	0.02	26.08	0.35
	(93.80)	(0.13)	(0.01)	(8.49)	(0.12)
	[2872.06]	[5.35]	[0.65]	[481.01]	[3.85]
Year 3	344.16	0.16	0.01	34.94	0.37
	(108.30)	(0.13)	(0.01)	(9.16)	(0.13)
	[3544.80]	[5.99]	[0.69]	[534.19]	[4.42]
Year 4	514.27	0.33	0.03	38.40	0.56
	(123.43)	(0.13)	(0.01)	(10.41)	(0.13)
	[4293.72]	[6.56]	[0.71]	[596.48]	[4.99]
Year 5	612.70	0.32	0.02	46.09	0.61
	(136.62)	(0.13)	(0.01)	(11.42)	(0.13)
	[4697.95]	[6.74]	[0.73]	[636.52]	[5.25]
Year 6	671.91	0.36	0.01	57.97	0.56
	(148.40)	(0.13)	(0.01)	(12.59)	(0.14)
	[5181.95]	[7.06]	[0.75]	[669.52]	[5.60]
Year 7	654.40	0.31	0.02	44.12	0.59
	(159.65)	(0.13)	(0.01)	(13.42)	(0.14)
	[5759.46]	[7.46]	[0.76]	[708.48]	[5.93]
Observations	90,423	90,423	90,423	67,793	90,423

Source: Administrative data and YET Application Form.
Notes: Replicates Table 1, using fixed effects for the number of applications across localities instead of controlling for it linearly.

Table B7: Effect of YET on Labor Outcomes (Restricted to Youth Applying to Only One Program Edition)

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Program year					
Year 0	2024.36	6.63	0.56	-24.58	7.49
	(45.25)	(0.08)	(0.01)	(3.50)	(0.08)
	[1215.46]	[2.89]	[0.44]	[361.75]	[1.89]
Post-Program years					
Year 1	-66.16	-0.19	0.04	-5.78	0.27
	(83.20)	(0.13)	(0.01)	(8.40)	(0.13)
	[2111.54]	[4.40]	[0.59]	[421.41]	[3.01]
Year 2	116.25	-0.04	0.01	17.65	0.29
	(105.26)	(0.14)	(0.01)	(9.69)	(0.14)
	[2812.66]	[5.26]	[0.64]	[478.75]	[3.71]
Year 3	226.37	0.07	-0.00	26.45	0.29
	(121.49)	(0.15)	(0.01)	(10.41)	(0.15)
	[3425.89]	[5.86]	[0.68]	[527.62]	[4.24]
Year 4	476.15	0.41	0.03	28.66	0.60
	(138.67)	(0.15)	(0.01)	(11.88)	(0.15)
	[4133.36]	[6.37]	[0.70]	[591.54]	[4.72]
Year 5	625.63	0.43	0.03	39.12	0.70
	(154.53)	(0.15)	(0.01)	(13.12)	(0.15)
	[4509.95]	[6.52]	[0.71]	[631.45]	[4.97]
Year 6	736.59	0.44	0.02	55.66	0.63
	(170.31)	(0.15)	(0.01)	(14.65)	(0.16)
	[4944.62]	[6.82]	[0.73]	[660.62]	[5.32]
Year 7	723.99	0.39	0.03	43.53	0.66
	(182.59)	(0.15)	(0.01)	(15.57)	(0.16)
	[5407.99]	[7.11]	[0.74]	[696.39]	[5.54]
Observations	65,239	65,239	65,239	48,089	65,239

Source: Administrative data and YET Application Form.
Notes: Replicates Table 1, but restricts the sample to youth who applied to only one edition of the program.

Table B8: Effect of YET on Labor Outcomes (Application-level Regression)

	(1) Total earnings	(2) Months with earnings	(3) Positive earnings	(4) Wages	(5) Months with regular job
Program year					
Year 0	2141.51	6.83	0.55	-18.90	7.63
	(44.04)	(0.08)	(0.01)	(3.20)	(0.07)
	[1159.17]	[2.77]	[0.45]	[359.18]	[1.81]
Post-Program years					
Year 1	62.71	-0.05	0.04	5.23	0.33
	(76.66)	(0.12)	(0.01)	(7.68)	(0.12)
	[2099.42]	[4.45]	[0.60]	[419.90]	[3.09]
Year 2	178.47	-0.03	0.02	22.51	0.26
	(98.13)	(0.13)	(0.01)	(9.07)	(0.13)
	[2932.30]	[5.45]	[0.66]	[484.73]	[3.97]
Year 3	270.06	0.06	0.01	31.38	0.22
	(115.57)	(0.14)	(0.01)	(9.71)	(0.14)
	[3645.17]	[6.12]	[0.70]	[538.61]	[4.57]
Year 4	444.78	0.23	0.02	36.92	0.44
	(131.77)	(0.14)	(0.01)	(11.05)	(0.14)
	[4430.35]	[6.72]	[0.72]	[602.18]	[5.17]
Year 5	505.55	0.23	0.01	39.77	0.50
	(144.02)	(0.13)	(0.01)	(11.97)	(0.14)
	[4854.66]	[6.88]	[0.74]	[644.54]	[5.40]
Year 6	554.35	0.27	0.00	48.62	0.46
	(154.72)	(0.14)	(0.01)	(13.12)	(0.14)
	[5349.12]	[7.21]	[0.75]	[679.96]	[5.75]
Year 7	516.32	0.22	0.02	33.07	0.50
	(164.53)	(0.13)	(0.01)	(13.88)	(0.14)
	[5948.84]	[7.61]	[0.77]	[721.26]	[6.08]
Observations	122,195	122,195	122,195	92,753	122,195

Source: Administrative data and YET Application Form.
Notes: Replicates Table 1, but keeps all applications submitted by each individual and clustering standard errors at the applicant level. All applications within the year when the youth participated in the program are considered treated units. We use as instrument whether the youth received an offer in the edition year of that application.

Table B9: Bounds for the ITT Effects on Monthly Wages (Post-program Years)

	(1) ITT effect on wages	(2) Lee bounds on wage effects	(3)	(4) Imbens and Manski 95% Confidence Interval	
		Lower	Upper	Lower	Upper
Year 1	5.88 (5.77) [438.53]	-27.66 (4.99)	28.93 (5.62)	-35.86	38.18
Year 2	19.74 (6.54) [495.25]	17.90 (6.46)	29.07 (6.48)	7.27	39.73
Year 3	26.92 (7.14) [550.99]	25.78 (7.10)	31.83 (7.10)	14.10	43.51
Year 4	29.88 (8.13) [611.72]	6.98 (7.40)	41.00 (8.08)	-5.19	54.30
Year 5	36.12 (8.99) [657.42]	33.78 (8.91)	41.72 (8.98)	19.13	56.49
Year 6	45.45 (9.92) [692.67]	43.59 (9.84)	52.30 (9.89)	27.40	68.58
Year 7	34.25 (10.53) [725.81]	2.25 (9.45)	47.28 (10.53)	-13.30	64.59
Observations	90,423				

Source: Administrative data and YET Application Form.
Notes: This table presents bounds on causal effect on wages for the "always employed" (individuals who would be employed regardless of whether they are offered the program job or not) based on the procedure described in Lee (2009). To obtain the upper bound, we trim the sample of observed wages in the offered group with the p percent lower wages, where p is the ratio of the ITT effect on employment over the employment rate on the offered group. The lower bound is the symmetric case where we trim the p percent higher wages. Robust standard errors shown in parenthesis and control means in brackets. We follow Imbens and Manski (2004) to construct confidence intervals for the bounds.

C Robustness Checks on Cost-Benefit Analysis

As noted in the main text, the baseline MVPF for YET is 3.1 over the first seven years and infinite over the life cycle, with full fiscal recovery by age 46. Our baseline specification follows that of Hendren and Sprung-Keyser (2020b), hereafter HSK.[1]

In this appendix, we assess the robustness of our conclusions by exploring alternative scenarios that vary the tax rate, direct costs, and discount rate. Specifically, we examine four variants of the baseline scenario. The main features and findings for each variant are summarized in Table C1.

Scenario 2 mirrors Scenario 1, with the difference that it includes payroll taxes in the tax rate. In our baseline specification, payroll taxes are excluded to be conservative and because they are partially returned to workers as benefits. In this variant, however, workers' payroll contributions are counted as government revenue. Including payroll taxes increases the government's fiscal gain from higher post-program earnings, thereby reducing net costs and causing them to turn negative earlier. As a result, the MVPF becomes infinite by age 32, compared to age 46 in the baseline scenario. For comparison, under a 30 percent tax rate—which approximates our age-specific tax rates from the early 30s onward when payroll taxes are included—HSK (2020b) show that job training programs yield, on average, MVPFs below 1, while childhood interventions maintain infinite MVPF by the end of the life cycle (see Appendix Figure V, Panel D, in HSK, 2020b). Thus, even under the higher tax rate assumption, YET continues to perform comparably to these high-return childhood interventions.

Scenario 3 is identical to Scenario 1, except that it excludes participants' salaries from direct costs. In our baseline scenario, 50 percent of salaries are counted as program costs. Excluding salaries from costs sharply reduces net costs, allowing the program to repay itself by age 20. This scenario reinforces our main conclusions, but it is the least conservative.

Scenario 4 is identical to Scenario 1, except that it includes 100 percent of participants' salaries as direct costs. This is a highly conservative approach, effectively assuming that participants generated no value through their work. Hence, it represents an upper-bound estimate, as firms volunteered to participate and participants likely generated added value through their work. Under this scenario, the program does not repay itself by age 65, resulting in lower performance compared to childhood interventions.

[1] We depart from HSK (2020b) in one way. We use yearly tax rates instead of fixed ones, as this information is available in our setting and provides greater precision.

However, the performance of YET relative to job training programs targeting similar age groups remains strong: the MVPF 8 and 21 years after the program are 1.7 and 6, respectively, which compare favorably to many job training programs (see Figure A2).

Scenario 5 applies a higher discount rate of 7 percent to the baseline specification, following a robustness test in HSK (2020b). The discount rate is used to discount changes in real earnings back to the program year. This scenario is the most conservative, and under these conditions, the MVPF does not become infinite over the life cycle. Importantly, adopting a higher discount rate does not change our main conclusions. For comparison, HSK (2020b) also find that, with a 7 percent discount rate, even childhood interventions no longer yield infinite MVPFs, and our program continues to perform comparably to these interventions under this conservative assumption (see Appendix Figure IV, Panel D, in HSK, 2020b).

Overall, these robustness checks show that varying key assumptions does not substantially affect the relative performance of YET.

Table C1: MVPF Under Different Assumptions

Scenario	Discount rate	Payroll taxes	Salaries in costs (%)	MVPF 26	MVPF 65	Age MVPF = ∞
1 (Baseline)	0.03	No	50%	3.08	∞	46
2	0.03	Yes	50%	4.15	∞	32
3	0.03	No	0%	∞	∞	20
4	0.03	No	100%	1.48	41.17	–
5	0.07	No	50%	2.76	24.94	–

Source: Administrative and household survey data.
Notes: Scenario 1 reports the baseline specification, which applies a 3 percent discount rate, excludes payroll taxes from the tax rate, and includes 50 percent of salaries as direct costs. Scenario 2 incorporates payroll taxes into the tax rate. Scenario 3 excludes salaries from direct costs. Scenario 4 includes 100 percent of salaries as direct costs. Scenario 5 is identical to the baseline except that it applies a higher discount rate of 7 percent.

D Institutional Details: The Work-Study Program

The work-study program "Yo Estudio y Trabajo" (YET) operates in 77 localities across Uruguay, covering nearly all major cities.

Applicants can complete the application online or at an employment center. To participate, selected applicants must present proof of enrollment from an educational institution showing at least 240 hours of attendance, a valid national ID, and, if over age 18, an electoral card. Eligibility is verified by cross-checking social security data to confirm that the applicant is not formally employed. Students must also provide updated enrollment proof every three months. Those aged 16–17 receive guidance on how to obtain a work permit.

As of January 2016, participants earn a fixed monthly salary of 13,360 pesos (equivalent to four times the minimum tax unit) for 30 hours of work per week. Pregnant women and mothers with children under age 4—who make up about 4 percent of lottery applicants—receive 50 percent higher wages.

Students can reapply in future rounds under specific rules. Those who begin a job through the program cannot apply again, while those who are selected but do not take up a position may reapply, but do not receive any priority.

Firms agree in advance to participate in the program. Once youths are randomly selected, participating firms are required to hire the individuals assigned by the program. From the firms' perspective, opening temporary one-year positions in state-owned enterprises is not straightforward. The program simplifies this process by enabling them to fill additional vacancies quickly without burdensome procedures. Firms also retain the option to dismiss youths who fail to meet performance expectations; however, high completion rates suggest that this rarely occurred.

Importantly, the list of participating firms is announced publicly before the application period begins. As a result, applicants know which firms are involved at the time of application and can anticipate their potential placements. In some small regions, only a single firm participates, meaning that applicants' information about their likely placement is nearly complete. State-owned enterprises involved in the program are considered prestigious employers, and their positions attract strong demand. In addition, the tasks assigned to program participants are typically less physically demanding than those undertaken by comparable workers outside the program. A plausible explanation for the high completion rates is that applicants were positively selected: those who applied to the program demonstrated a genuine interest in working and were motivated

to complete their assignments. Furthermore, participants who complete the full contract period are granted a work certificate.

E Returns to Education and Returns to Experience

In this section, we present our back-of-the-envelope computation of the contribution of the education and experience channels to the long-term effects of the YET work-study program. First, we review existing estimates of the returns to schooling and to work experience from recent literature and obtain a range of relevant estimates for Uruguay. Second, we combine these estimated returns with the work-study program effects on schooling and experience to quantify their respective contributions to Year–7 effects on earnings.

Gethin (2025) reports estimates of the returns to education for 154 countries, including Uruguay. He runs an OLS estimation of a modified Mincerian regression, controlling for gender, an age quartic, and their interaction. For Uruguay, he uses data from the Continuous Household Survey (ECH 2019). The estimated returns to schooling for Uruguay are 9.96 percent. A well-recognized issue with OLS estimates is selection bias. In a meta-analysis of 33 studies, Gethin (2025) finds that IV estimates of the returns to schooling (correcting for selection) are on average 40 percent higher than OLS estimates. Uruguay is not included in the meta-analysis, but applying the average IV-OLS gap, we obtain an upper bound of 14 percent for the returns to schooling.

Jedwab et al. (2023) report estimates of the returns to potential work experience for 145 countries. They run OLS estimations of a Mincerian regression controlling for years of education. Their Figure 3 reports returns to experience of 2.8 percent for Uruguay, slightly higher than the world average. In their online appendix, Figure A.3 reports returns to schooling of 11 percent, close to Gethin (2025).

Lagakos et al. (2018) study the sensitivity of Mincerian returns to potential experience to the well-known cohort–time–age collinearity issue and to measurement error in work experience. They find that, in rich countries, the average wage of workers with 20–24 years of experience is between 91 and 96 percent higher than that of workers with 0-–4 years of experience in Table 3, between 47 and 90 percent higher in Table 4, and between 70 and 100 percent higher in Table 5, depending on the estimation methodology. The lower and upper bounds of these ranges correspond to 59 percent (47/79) and 127 percent (100/79) of their baseline estimate of 79 percent in Table 5. In Figure 3, they show that the percentage wage increase at 20–24 years of experience in Uruguay is 75

percent, which corresponds to a yearly return of around 3.8 percent (Extended National Survey of Households, 2006, available from IPUMS). To account for estimation sensitivity around the Uruguayan estimate, we consider a lower bound of 2.2 percent (= 0.59×3.8) and an upper bound of 4.8 percent (= 1.27×3.8). The returns to experience in Jedwab et al. (2023) lie within that range.

To sum up, relevant estimates of the returns to schooling range from 10 to 14 percent, and those for work experience range from 2 to 5 percent. We find that the work-study program increases education by 0.27 years and actual work experience by 0.7 years. The education channel generates an earnings increase between 2.7 percent (= 0.27×10 percent) and 3.8 percent (= 0.27×14 percent), while the experience channel generates an increase between 1.4 percent (= 0.7×2 percent) and 3.5 percent (= 0.7×5 percent).

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