

The (Perceived) Returns to Education and the Demand for Schooling

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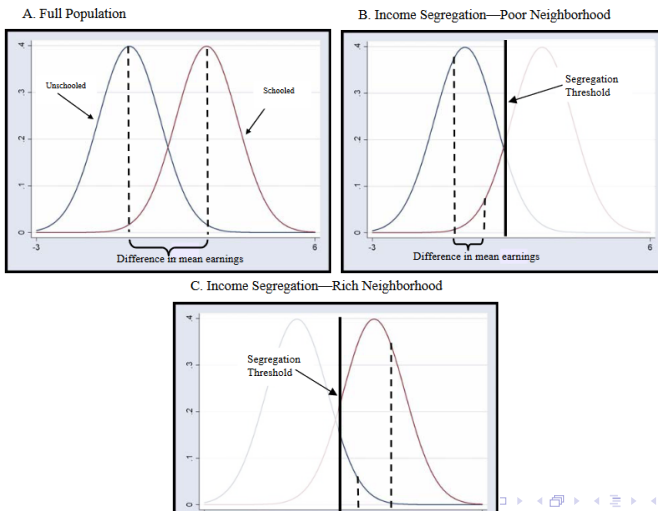
Overview

- 1 Research Question
- 2 Background
- 3 Data and Treatment
- 4 Results
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Research Question

- How do students choose their level of education?
- Canonical model of human capital Becker (1964).
- Education is an investment. Students maximize return of increased wages less the cost of extra time spent in school, and forgone earnings.
- But what if students' perceptions about future earnings are incorrect?
- Students use their perception instead of true return to education when making optimizing decision, so we don't expect them to choose optimal level of education for themselves, or society.

Why the Perception Gap?



Background

- Setting: Dominican Republic, 2001
- Education is only compulsory through 8th grade (primary school)
- 80-90% complete primary school, but only 25-30% complete secondary school
- Workers with high school education earn 40% more than those who only complete middle school
- Compared to US, students in low income countries have fewer opportunities to learn about large returns to education before compulsory schooling ends.
- No guidance councilors in schools
- Limited information on national earnings because of limited government data
- Info on earnings comes primarily from observing community

Background

Explanations to the puzzle:

1 Credit constraints

- PROGRESA program in Mexico provided schooling vouchers to combat this

2 High discount rate

3 Low demand for education

- Providing more accurate info about true returns to education might stimulate demand
- Stimulating demand for school's returns directly may even increase benefit of education by incentivizing students to care about schooling rather than only the cash reward of attending

Data

- 1,500 non-rural household survey to determine incomes, and returns to schooling
- Interviewed 15 random eighth grade boys from each of the 150 selected schools
- Follow up survey beginning of next academic year
- Follow up surveys on still enrolled students each of next two years
- Students asked to estimate their expected earnings with varying levels of schooling. To combat students having hidden knowledge about their own prospects they were asked the same questions but about earnings of current adults.

Treatment

- Post interview, treated school children were given estimated returns to education based on income survey
- Randomization at school level to prevent cross-contamination from students sharing this info between each other
- Three outcomes of interest
 - 1 Return to school after 8th grade
 - 2 Completion of secondary school
 - 3 Total Years of Schooling

Baseline Characteristics

TABLE III
MEASURED AND PERCEIVED MONTHLY EARNINGS, MALES AGED 30–40

	(1) Measured mean	(2) Perceived (self)	(3) Perceived (others)
Primary	3,180 [1,400]	3,516 [884]	3,478 [863]
Secondary	4,479 [1,432]	3,845 [1,044]	3,765 [997]
Tertiary	9,681 [3,107]	5,127 [1,629]	5,099 [1,588]
Secondary – primary	1,299	329 [403]	287 [373]
Tertiary – secondary	5,202	1,282 [1,341]	1,334 [1,272]

Notes. All figures in 2001 Dominican pesos (RD\$). Standard deviations in brackets. Column (1) provides the mean earnings among men aged 30–40 from a household survey conducted by the author in January 2001. The number of observations is 1,278 primary, 339 secondary, and 83 tertiary. Columns (2) and (3) provide data from the Round 1 survey of eighth-grade male students, conducted by the author in April/May 2001. Column (2) refers to what current students expect to earn themselves under different education scenarios when they are 30–40. Column (3) refers to what current students believe current workers 30–40 years old with different education levels earn. For both columns, there are 2,025 observations with responses for primary and secondary, and 1,847 responses for tertiary.

Baseline Characteristics

- Thinking back to human capital model: Overestimate leads to higher opportunity cost to schooling; Underestimate leads to smaller returns to continued education \Rightarrow underinvest in education
- With these incorrect expectations, students are making rational decision to leave school under some very reasonable assumptions
- Assuming they work until age 65, and have a discount rate of 0.05, students' present value of expected lifetime earnings is 11% greater with only a primary school education even if schooling was completely free
- Show that increases to expected returns to education increase schooling outcomes of interest

Baseline Characteristics

TABLE II
IMPLIED PERCEIVED RETURNS AND SCHOOLING

	Panel A. Round 1 implied perceived returns (control group only)						Panel B. Round 2 implied perceived returns (full sample)					
							Instrumental variables					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Returned next year	Returned next year	Finished school	Finished school	Years of schooling	Years of schooling	Returned next year	Finished school	Years of schooling	Returned next year	Finished school	Years of schooling
Implied perceived returns	0.11*** (0.030)	0.083** (0.034)	0.14*** (0.036)	0.092** (0.038)	0.53*** (0.13)	0.37** (0.14)	0.095*** (0.21)	0.088*** (0.019)	0.37*** (0.075)	0.16** (0.071)	0.096* (0.055)	0.63*** (0.22)
Log (inc. per capita)		0.090 (0.062)		0.25*** (0.063)		0.76*** (0.24)	0.044 (0.045)	0.18*** (0.048)	0.61*** (0.17)	0.023 (0.049)	0.18*** (0.051)	0.52*** (0.17)
School performance		0.015 (0.014)		0.015 (0.011)		0.093** (0.045)	0.014 (0.010)	0.021** (0.008)	0.087** (0.034)	0.013 (0.010)	0.021** (0.008)	0.086** (0.034)
Father finished secondary		0.036 (0.041)		-0.014 (0.044)		0.045 (0.16)	0.067** (0.032)	0.045 (0.029)	0.21* (0.12)	0.066** (0.032)	0.045 (0.029)	0.20* (0.12)
Age		-0.017 (0.024)		0.006 (0.025)		-0.045 (0.093)	-0.011 (0.019)	0.004 (0.016)	-0.006 (0.066)	-0.011 (0.019)	0.004 (0.016)	-0.003 (0.067)
R ²	.008	.016	.017	.048	.016	.042	.027	.050	.053	.022	.050	.046
Observations	1,003	1,003	1,003	1,003	918	918	1,899	1,899	1,809	1,899	1,899	1,809

Notes. Heteroscedasticity-consistent standard errors accounting for clustering at the school level in parentheses. Data are from a survey of eighth-grade male students, conducted by the author. Returned next year is measured in Round 2; finished school and years of schooling are measured in Round 3. Implied perceived returns is the difference between own expected earnings at age 30–40 with primary and with secondary schooling, measured in thousands of 2001 Dominican pesos (RD\$1,000). Columns (1)–(6) (Panel A) use Round 1 implied perceived returns as an independent variable and columns (7)–(12) (Panel B) use Round 2 implied perceived returns. Columns (1), (3), and (5) use no other control variables; all other columns add age, school performance, whether father finished secondary school, and log income per capita as additional controls. School performance is teacher assessment of the student's performance, on a scale of 1 to 5 (much worse than average, worse than average, average, above average, much better than average). Age, school performance, and whether father finished secondary were gathered in the Round 1; income was measured in Round 2. Regressions also include an indicator for whether income data were unavailable (these households are assigned the median sample income). In columns (10)–(12), implied perceived returns is instrumented using an indicator for having received the treatment.

Treatment

“Before we end, I would like to provide you with some information from our study. In January, we interviewed adults living in this community and all over the country. We asked them about many things, including their earnings and education. We found that the average earnings of a man 30 to 40 years old with only a primary school education was about 3,200 pesos per month. And the average income of a man the same age who completed secondary school, but did not attend university, was about 4,500 pesos per month. So the difference between workers with and without secondary school is about 1,300 pesos per month; workers who finish secondary school earn about 41 percent more than those who don’t. And people who go to university earn about 5,900 pesos per month, which is about 85 percent more than those who only finish primary school.”

Results

- In first follow up survey six months later, the treatment group had expected earnings from primary school education drop by RD\$284 \approx \$17 and an increase of RD\$80 \approx \$5 in per month earnings
- Using a simple two-by-two diff-in-diff design recover a statistically significant increase in expected earnings of RD\$377 \approx \$23.
- Focus on change in expected earnings for other people to negate any selection on unobservables for own earnings

Results

TABLE IV
EFFECT OF THE INTERVENTION ON EXPECTED RETURNS AND SCHOOLING: NO COVARIATES

	Panel A. Perceived returns to school				
	Round 1		Round 2		
	Control	Treatment	Control	Treatment	Difference-in-difference
Expected earnings (self):					
Primary (only)	3,548 (116)	3,484 (124)	3,583 (118)	3,230 (92)	-284*** (43)
Secondary (only)	3,884 (132)	3,806 (145)	4,001 (132)	3,995 (114)	82* (44)
Implied perceived returns	336 (25)	322 (27)	418 (24)	765 (34)	366*** (29)
Expected earnings (others):					
Primary (only)	3,509 (112)	3,447 (120)	3,546 (113)	3,204 (92)	-274*** (41)
Secondary (only)	3,802 (126)	3,728 (143)	3,892 (120)	3,916 (111)	102*** (45)
Implied perceived returns	293 (23)	281 (29)	346 (22)	712 (31)	377*** (26)
Number of observations	1,003	1,022	922	977	1,859

Results

- We have strong evidence that the treatment effects perceived earnings, but that only matters if that translates to better schooling outcomes
- The results for schooling outcomes are weaker
- The estimating equation is

$$Schooling_i = \beta_0 + \beta_1 Treatment_i + \beta Controls_i + \epsilon_i$$

- Notice we are estimating an intent to treat effect. This is the effect of interest here because we care about the outcome from implementing this policy.

Results

TABLE V
EFFECTS OF THE INTERVENTION ON EXPECTED RETURNS AND SCHOOLING

	Full sample				Poor households				Least poor households			
	(1) Returned next year	(2) Finished school	(3) Years of schooling	(4) Perceived returns	(5) Returned next year	(6) Finished school	(7) Years of schooling	(8) Perceived returns	(9) Returned next year	(10) Finished school	(11) Years of schooling	(12) Perceived returns
Treatment	0.041*	0.023	0.20**	367***	0.006	-0.01	0.037	344***	0.072*	0.054*	0.33***	386***
	(0.023)	(0.020)	(0.082)	(28)	(0.034)	(0.026)	(0.11)	(41)	(0.038)	(0.031)	(0.12)	(41)
Log	0.095**	0.23***	0.79***	29.0	0.054	0.26***	0.69***	188**	0.047	0.10	0.51	23
(inc. per capita)	(0.040)	(0.044)	(0.16)	(47)	(0.068)	(0.062)	(0.23)	(87)	(0.12)	(0.13)	(0.45)	(133)
School	0.011	0.019**	0.086**	0.74	0.001	0.015	0.064	-9.5	0.025*	0.024*	0.10**	8.2
performance	(0.010)	(0.009)	(0.034)	(14)	(0.014)	(0.012)	(0.048)	(13.5)	(0.013)	(0.012)	(0.048)	(22)
Father	0.074**	0.050*	0.26**	-24	0.056	0.019	0.16	-29.1	0.096**	0.096**	0.36**	-3.8
finished sec.	(0.030)	(0.030)	(0.12)	(32)	(0.045)	(0.043)	(0.18)	(62)	(0.038)	(0.038)	(0.14)	(40)
Age	-0.010	0.004	-0.006	-42*	-0.042	0.002	-0.071	-46	0.005	0.005	0.025	-35
	(0.016)	(0.015)	(0.059)	(21)	(0.030)	(0.019)	(0.088)	(32)	(0.025)	(0.035)	(0.087)	(29)
R ²	.016	.040	.049	.090	.007	.019	.014	.094	.020	.020	.029	.090
Observations	2,241	2,205	2,074	1,859	1,055	1,055	1,007	920	1,056	1,056	1,002	939

Notes. Heteroscedasticity-consistent standard errors accounting for clustering at the school level in parentheses. Data are from a survey of eighth-grade male students, conducted by the author. Returned next year is measured in Round 2; finished school and years of schooling are measured in Round 3. Perceived returns in columns (4), (8), and (12) is the change between Round 2 and Round 1 in the difference between what students expect to earn themselves with primary and secondary schooling when they are 30–40, measured in 2001 Dominican pesos (RD\$). All regressions also include an indicator for whether income data were unavailable (these households are assigned the median sample income). In columns (5)–(12), youths are split according to whether they live in a household that is below (poor) or above (least poor) the median household income per capita; households with missing income data are excluded from both categories. School performance is teacher assessment of the student's performance, on a scale of 1 to 5 (much worse than average, worse than average, average, above average, much better than average). Age, school performance, and whether the father finished secondary were gathered in the first round; income was gathered in the second round.

Results

- Small and imprecise effect on schooling outcomes
- Increasing the demand for schooling through the intervention was effective for the least poor households, but not for poorest households
- Remember the credit constraint story from the human capital model. Demand is not sufficient condition for schooling. Poorest households may not be able to fund additional schooling because of credit constraints
- Notice both groups had similar impact on perceived earnings

Discussion

- Finding of deflated earning gap for education could reflect a development trap for the Dominican Republic, so policy priority to increase education stock in the country
- Advantages of demand based intervention:
 - 1 Far cheaper than school vouchers
 - 2 Greater commitment to schooling. Treatment increased time spent on homework by 11 minutes a week
- Limitations of demand based intervention:
 - 1 Other constraints such as credit constraint may dominate
 - 2 If estimates of earnings given to children are highly inaccurate it may undermine faith in other government facilities

Discussion

This study has a number of limitations

- The sample is limited to only boys because low female labor force participation rates led to girls to refuse to give an estimate for expected earnings
- It was difficult to elicit accurate returns to age from the youths. Numeracy is limited in the schools, so the survey questions had to be as general as possible to be comprehensible.

Despite these limitations the paper presents a positive results that matches the theoretical predictions of the model nicely