

Lecture 8: Education

EC2303: Intermediate Development Economics

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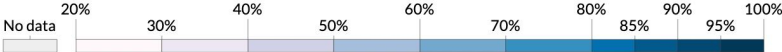
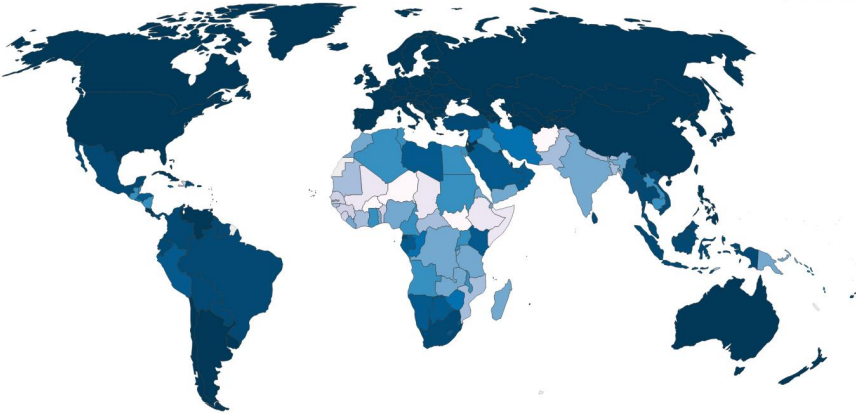
Lecture overview

- ▶ Low-income settings are associated with poor quality of schooling and low educational attainment
- ▶ Supply-side explanations:
 - ▶ Poor countries don't have the money to build schools, train teachers, etc. If they did, outcomes would improve. We'll look at a paper by Esther Duflo (2001) on school construction in Indonesia.
 - ▶ Even once students are in school, teaching doesn't happen "at the right level". The paper by Duflo et al. that you read measures the effect of fixing this. (Different Duflo: Annie Duflo, Esther's sister!)
- ▶ Demand-side explanation: children don't attend/complete school because the perceived returns are low. We'll look at a paper by Robert Jensen on providing information about returns to education.

Literacy rate by country, 2011

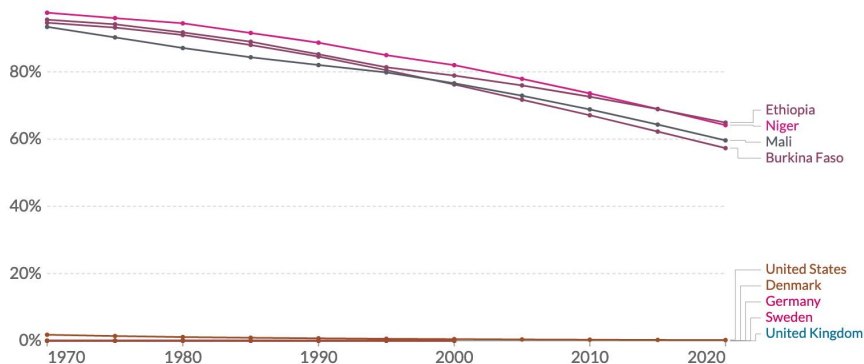
Our World in Data

World



Share of the population with no formal education

Our World in Data



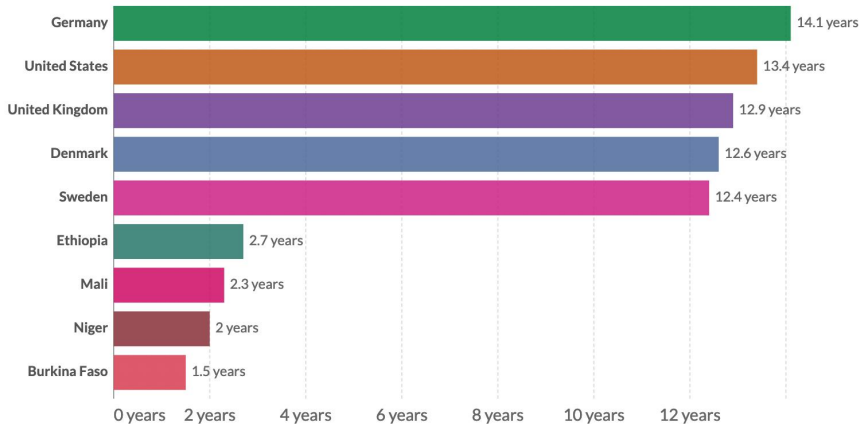
Source: International Institute for Applied Systems Analysis (IIASA): World Population and Human Capital in the Twenty-First Century (2015)

Note: The data on past and projected rates of educational attainment comes from the International Institute for Applied Systems Analysis (IIASA). These projections are constructed using current Global Economic Trends (GET). There are other scenarios available, including a best and worst case.

OurWorldInData.org/primary-and-secondary-education • CC BY

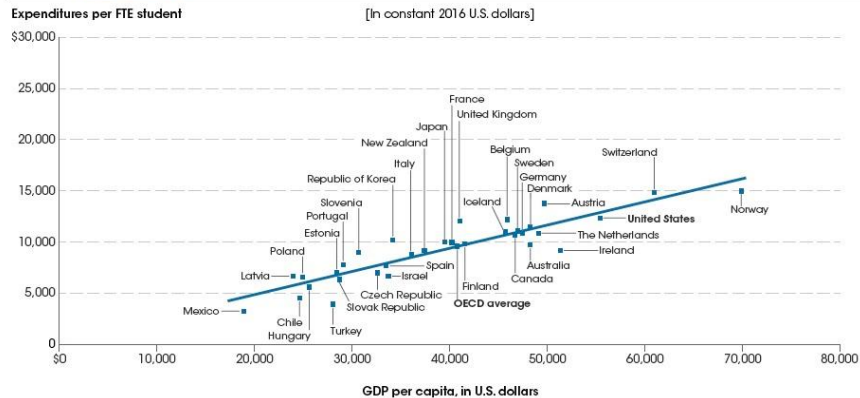
Mean years of schooling, 2017

Our World in Data



Supply-side problem: Low-income countries spend less on education

Figure 3. Expenditures per full-time-equivalent (FTE) student for elementary and secondary education in selected Organization for Economic Cooperation and Development (OECD) countries, by gross domestic product (GDP) per capita: 2014



Do investments in education improve educational attainment & wages?

Duflo, 2001

- ▶ It's not necessarily wrong for low-income countries to spend less on education: perhaps the demand isn't there? Possibly because returns in the local labor market are low.
- ▶ One way to address this question is to see what happens when extra schools are provided: is there an increase in educational attainment, and wages?
- ▶ This is what Esther Duflo did in a paper from 2001.
- ▶ In 1973, the Indonesian government launched a major school construction program, the Sekolah Dasar INPRES program.
- ▶ Between 1973–1974 and 1978–1979, more than 61,000 primary schools were constructed — an average of two schools per 1,000 children aged 5 to 14 in 1971.
- ▶ What were the effects on educational attainment and wages?

Identification strategy: difference-in-differences

Duflo, 2001

- ▶ Possible approach 1: Compare children in regions where many schools were built to those in regions where few were built
Problem: regions where many schools were built really needed them, and had lower educational attainment to start with. So this comparison confounds the treatment effect of new schools with the pre-existing difference across regions.
- ▶ Possible approach 2: Compare children of an age that allowed them to benefit from new schools with children who were too old to benefit
Problem: educational attainment increases over time even without new schools (“secular trend” or “time trend”). So this comparison confounds the treatment effect of new school with the time trend in educational attainment.
- ▶ The trick of difference-in-differences: compare approach 1 to approach 2, i.e. subtract one difference from the other.

Identification strategy: difference-in-differences

Duflo, 2001

Fictitious (!) example

Years of education completed	Region with few new schools	Region with many new schools
Children of an age that did not allow them to benefit from new schools	8	7
Children of an age that allowed them to benefit from new schools	9	10

- ▶ Approach 1: Compare children in regions where many schools were built to those in regions where few were built: $10-9=1$ extra year of schooling. Underestimates the true effect because the regions where many schools were built were worse off to begin with. How much worse off were they? $8-7 = 1$ year of schooling. So add this “handicap” to the estimated effect to get 2 extra years of schooling. This is the difference-in-difference estimator.
- ▶ Approach 2: Compare children of an age that allowed them to benefit from new schools with children who were too old to benefit: $10-7 = 3$ extra years of schooling. Overestimates the true effect because children who benefitted from schools were younger and would have gotten more education anyway. How much more would they have gotten? $9-8=1$ extra year of schooling. So subtract this “unfair advantage” from the estimated effect to get $3-1 = 2$ extra years of schooling. That’s the same difference-in-difference estimator.

Do more schools improve educational attainment & wages?

Duflo, 2001

TABLE 4—EFFECT OF THE PROGRAM ON EDUCATION AND WAGES: COEFFICIENTS OF THE INTERACTIONS BETWEEN COHORT DUMMIES AND THE NUMBER OF SCHOOLS CONSTRUCTED PER 1,000 CHILDREN IN THE REGION OF BIRTH

	Observations	Dependent variable					
		Years of education			Log(hourly wage)		
		(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Experiment of Interest: Individuals Aged 2 to 6 or 12 to 17 in 1974</i>							
<i>(Youngest cohort: Individuals ages 2 to 6 in 1974)</i>							
Whole sample	78,470	0.124 (0.0250)	0.15 (0.0260)	0.188 (0.0289)			
Sample of wage earners	31,061	0.196 (0.0424)	0.199 (0.0429)	0.259 (0.0499)	0.0147 (0.00729)	0.0172 (0.00737)	0.0270 (0.00850)

More schools improve educational attainment & wages

Duflo, 2001

- ▶ Each primary school constructed per 1,000 children increases average educational attainment by 0.12 to 0.19 years
- ▶ Wages increase by 1.5 to 2.7 percent
- ▶ Thus, improving the “supply” of education through the provision of more schools (in places where there aren't many to begin with) increases educational attainment and labor market outcomes.

Demand-side problem: students underestimate returns to education

Jensen, 2010

- ▶ In the Dominican Republic in 2002, 80–90% of students complete primary school, but only 25–30% complete secondary school.
- ▶ This is despite high returns to secondary education: those who complete secondary school earn about 40% more than those who don't.
- ▶ Perhaps this is because students underestimate these returns? Robert Jensen interviewed 8th-grade students in the Dominican Republic, the last year of primary school, about perceived returns to education.

Students underestimate returns to education

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.

Providing information about returns to education

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.

Effect of informing students about returns

- ▶ Informing students about the returns to education leads to increased perceived returns
- ▶ Students are 4.2 percentage points more likely to return to school (i.e. enter secondary school)
- ▶ And the intervention increases schooling by 0.18 years over the next 4 years
- ▶ Can you find these numbers in the Jensen (2010) paper (on the course website: <https://haushofer.ne.su.se/ec2303/>)?

Effect of informing students about returns

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

	Panel A. Perceived returns to school				Difference-in-difference
	Round 1	Round 2	Control	Treatment	
	Control	Treatment	Control	Treatment	
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

Effect of informing students about returns

	Panel B. Schooling					
	Round 2			Round 3		
	Control	Treatment	Difference	Control	Treatment	Difference
Returned to school?	0.55 (0.02)	0.59 (0.02)	0.042* (0.025)			
Completed secondary school?				0.30 (0.02)	0.32 (0.02)	0.020 (0.024)
Years of schooling completed				9.75 (0.070)	9.93 (0.073)	0.18* (0.098)
Number of observations	1,118	1,123	2,241	1,033	1,041	2,074

Notes. Standard errors, corrected for clustering at the school level, in parentheses. All measures of expected earnings are for earnings at 30–40, measured in nominal (2001) Dominican pesos (RD\$). Data are from a survey of eighth-grade male students, conducted by the author. Round 1 was conducted in April and May of 2001; Round 2 was conducted in October of 2001; Round 3 was conducted in May and June of 2005.

*Significant at 10%.

**Significant at 5%.

***Significant at 1%.

Summary

- ▶ Education in low-income settings suffers from both supply-side and demand-side problems: governments don't have a lot of money, so education is underprovided relative to existing demand. At the same time, parents and students may be misinformed about the benefits of school, so demand may be lower than it could be.
- ▶ What we haven't discussed: school quality varies widely and is not easy for parents/students to observe
- ▶ One aspect of this is “teaching at the right level”: schools may teach material that is too hard or too easy for the students. (Stark example: textbooks in English for students who don't speak it.) This is the focus of the paper by Annie Duflo, Jessica Kiessel, and Adrienne Lucas that you read. We'll talk about that in the second half of the lecture.

Next week

- ▶ Lecture 9: Wed 13/10 10:00–12:00, Auditorium 8, Södra huset hus D