We have seen that returns to education are positive, even at the primary level. Generally, there appears to be benefits of being educated at every level, both monetary and non-monetary. So education is in part an investment: parents invest in their children today, and they get the returns later. How do the cost and the (actual and perceived) returns influence parental decision to send their kids to school?

1 A simple model of educational choice

Parents make schooling decisions for their child. Their utility function as a function of schooling \(S\) and earnings of the child when he grows up \(y\) is:

\[
U(y, S) = m \cdot \ln(y) - h(S),
\]

(1)

where:
- \(S\) is :
- \(h(S)\) is :
- \(\ln(y)\) is :
- \(m\) is:
- What is the interpretation of this equation?

- What does this equation miss?

The earnings of the child when he grows will be:
\[ \ln(y) = a + b \times S \]  
(2)

To understand this formulation, derive both sides with respect to \( S \).

This formulation (which is very general in economics) is saying that for each new year of education, the future wage will go up by \( b \% \). \( b \) is called the \textit{economic returns to education}.

The formulation assumes that it is the same for each year, i.e that returns to education are \textit{linear} (in log term). Is it a reasonable assumption? How does it relate to the capacity curve debate?

Finally, we need to specify what the cost of education function looks like. Is it likely to be convex or concave? Is it likely that each year of education costs more or less than the next?

\[ h'(S) = r + \phi(S) \]  
(3)

We are now ready to solve the maximization problem of the parents:

replace equation (2) and (3) in equation (1), and take the derivative.

\[ S^* = \frac{mb - r}{\phi} \]  
(4)

Comment on this equation:

We are now in a position to think about what motivates parents in, or prevents them from sending their children to school: we have to think about what determines \( m, b, r, \) and \( \phi \).

2 What if the perception of the returns is different?

Although the real returns appear to have more or less this log-linear shape, people have a different view: they seem to think the returns to primary education are very low, and then that they are may be higher for higher levels. For example, in Madagascar, parents believed that each year of primary education would increase a child's income by 6 percent, each year of junior high education by 12 percent, and each year of senior secondary education by 20 percent.

To simplify assume that the perception of return is: \( \ln(y) = a \) if \( S < S \) and \( \ln(y) = a + dS \) if \( S \geq S \), with \( d > b \)

How does this modify the parent’s problem?
The optimal level of education is now:

\[ S^* = \frac{mb-r}{\phi} \text{ if } S^* \geq S \]

but it is \( S^{**} = 0 \) if \( S^* < S \).

What is the difference between the effect of an increase in the cost of education \( r \) or \( \phi \) in this model, compared to the previous model?

3 Adding Credit Constraint

Now assume that parents cannot afford more than \( h(S) = \bar{H} \)

3.1 Linear case

Under the first model, if \( h(S^*) \) is greater than \( \bar{H} \), what will parents do?

If they have two children, and can only afford a maximum of \( 2 \cdot \bar{H} \) for their education, and \( 2h(S^*) \) is greater than \( 2 \cdot \bar{H} \), how will they decide to educate their children.

3.2 S-shape case

Under the second model, assuming that \( S^* \) is greater than \( S \) but \( h(S^*) \) is greater than \( \bar{H} \), what are the possible cases:

- 
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With two children, assuming that \( S^* \) is greater than \( S \) but \( 2h(S^*) \) is greater than \( 2\bar{H} \), what are the possible cases now? Can we see inequality emerging between children who are otherwise completely equal?

Now suppose that one child has a slightly higher return \( d \) than the other. Which child will be selected?
4 Some empirical observations which are consistent with this model

4.1 Parents are sensitive to the perceived returns to education: Madagascar

Trang Nguyen: Experiment in Madagascar. Provided parents with simple report cards on the benefits of education (that were discussed by teachers) in randomly selected schools. (Control school=a school meeting but no information on the returns to education)

Parents who initially overestimated returns invest less: higher absence and lower test scores at the end of the year.

Parents who initially underestimated returns invest more: lower absence and higher test scores at the end of the year.

4.2 The returns to education are affected by the perception that there are jobs for graduates

Robert Jensen: Experiment in India. Recruiters for Back office processing operations were sent to villages in North India, for three years. (control villages=no recruitment). He found that in treatment villages, girls got more education (specifically english language education) and had better BMI.

4.3 There is “sibling” rivalry within the family

In Burkina Faso: Richard Akresh found that kids with higher cognitive scores are more likely to be in school. However, controlling for their own cognitive score, kids whose siblings have higher cognitive scores were less likely to be in school.

In Colombia: A randomized experiment (Leigh Linden, Marianne Bertrand, and co-authors) found that, when some kids received a conditional cash transfer to attend school, their siblings got less schooling than the siblings of the control students.

4.4 Perception of jobs for graduates increases the sibling rivalry among boys

Jensen BPO experiment found no effect on boys education on average. But there was an interesting dichotomy: in family with more than one kid, kids whose parents said at baseline
that they wanted them to stay on the farm had a NEGATIVE effect of the BPO experiment. Kids whose parents said that they wanted them to go to the city had positive effect of the experiment.

5 And some broader Implications

- Parental demand is for a system that produces an elite: they may not be that interested in remedial education.

- Teachers are given incentives to focus on the curriculum, regardless of whether students learn or not. Private schools have the same incentives.

- Children who are left behind get little from the education system, and they are quick to persuade themselves that education is not for them.

- Teachers also get persuaded that education is not for those children. Once better students or students who get more support leave for private school, teachers remaining in public schools are demotivated.

- Huge waste of talent based on a misunderstanding! But the misunderstanding has little chance to get corrected unless there is a shift: no one ever learns about what the child who got lost in second grade could have done.

- This explains both the huge effect of program that focus on changing pedagogy to focus on what children can learn (Pratham program, computer assisted learning) and the difficulty to get these programs adopted.