

Appendix

Measuring human capital

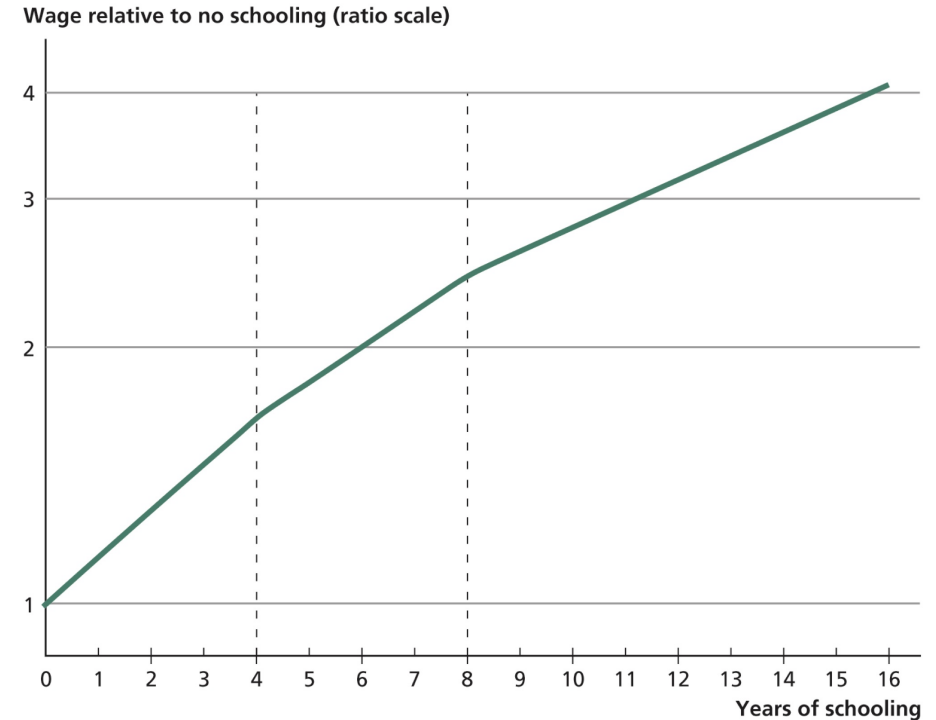
How can we measure human capital in a country?

1. Measure the value of spending one more year in school in different education levels
2. Characterize the distribution of years of schooling people have in a country
3. Find human capital for different education levels using step 1
4. Combining the 2nd and 3rd steps, generate a human capital index
 - Human capital index is a measure of average human capital in a country

(Private) returns to education

Step 1 in measuring human capital

- **Returns to education:** Increase in wages that a worker would receive if she had one more year of schooling.
 - a measure of spending one more year in school
- Estimates from Hall and Jones (1999)
 - First 4 years (grades 1 – 4): 13.4%
 - Next four years (grades 5 – 8): 10.1%
 - Beyond eight years: 6.8%



Breakdown of the population by schooling and wages

Step 2 in measuring human capital

Highest Level of Education	Years of schooling	Wage Relative to No Schooling	Percentage of the Population	
			Developing Countries	Advanced Countries
No Schooling	0	1.00	20.8	2.5
Incomplete Primary	4	1.65	10.4	3.4
Complete Primary	8	2.43	18.0	12.3
Incomplete Secondary	10	2.77	19.3	17.8
Complete Secondary	12	3.16	23.2	37.4
Incomplete Higher	14	3.61	2.9	9.9
Complete Higher	16	4.11	5.3	16.6
<i>Source: Barro and Lee (2010).</i>				

Table from Weil (2013)

Measuring human capital

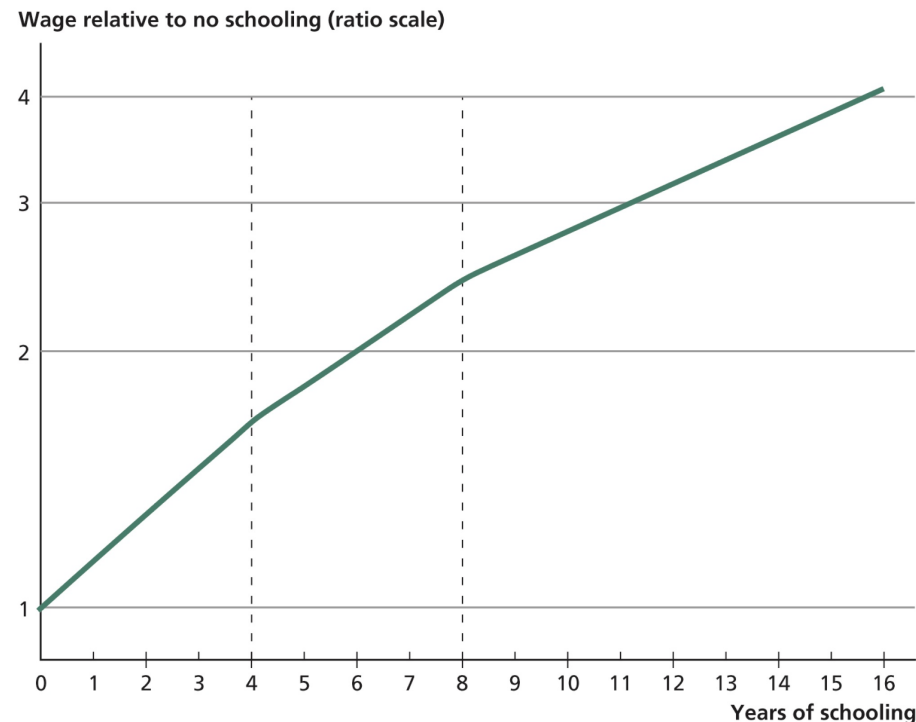
Steps 3 and 4 in measuring human capital

How can we measure human capital in the form of education?

$$h = h_0 \times \left(\left(\frac{w_1}{w_0} \right)^{t_1} \times \left(\frac{w_2}{w_1} \right)^{t_2} \times \dots \right)$$

- h_0 : level of labor input per worker with no schooling
- $\frac{w_i}{w_{i-1}}$: annual wage premium paid to education level i (primary, secondary, higher)
- t_i : years spend in education level i

Then take a weighted mean of worker specific human capital to measure average human capital in a country:



Example: Percentage of people with primary education times human capital of a worker with primary education, plus percentage of people with high school education times human capital of a worker with high school degree, and so on.

Human capital's share of wages

- Wage is paid to the combination of the hours worked (raw labor) and their quality (human capital)
- How much is paid to raw labor?
- How much is paid to human capital?
- Suppose a worker has five years of education.
- His wage would be $1.1344^4 \times 1.101 = 1.82$ times wage of a worker with no education
- $0.82/1.82 = 45\%$ to human capital, 55% to raw labor
- Now, apply this method to entire labor force

Share of human capital in wages

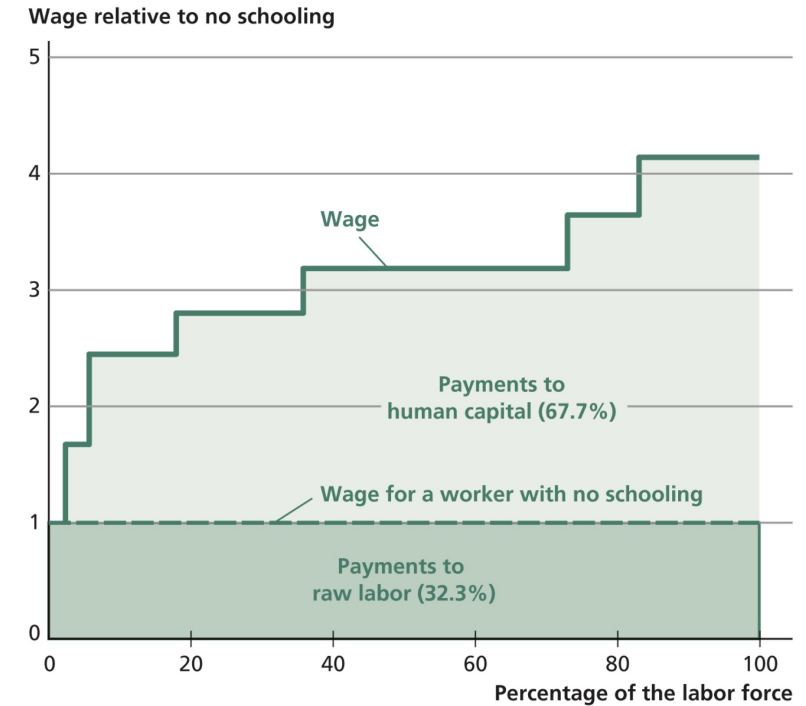
Developing countries



human capital's share of national income in developing countries = $\frac{2}{3} \times 58.5\% = 40\%$

Charts from Weil (2013)

Developed countries



human capital's share of national income in developed countries = $\frac{2}{3} \times 67.7\% = 45\%$