

Human Capital Part 1 - Labor Quality

I. What is Human Capital: The Schooling Model -

A. Unique set of abilities and acquired skills

1. education - improves your overall skills
2. on-the-job training - improves productivity on set of tasks
3. migration - move to where you are more productive

B. Focus on Schooling

1. in some circumstance: maximizing utility implies maximizes wealth
 - a. pick career path that maximizes income
 - b. borrow or lend to consume in periods to maximize utility
 - c. requires capital markets work well

C. Aside: Present Value

1. 2 ways to pay a debt of \$100 paid a year from now
 - a. pay \$100 a year from now
 - b. put approximately \$95 in the bank at 5% interest
 - c. dollar today is not worth a dollar tomorrow

$$\begin{aligned}100 &= PV(1 + r) \\ PV &= 100/(1+r) \\ &\text{if } r=5\% \\ PV &= 100(1+ 0.05) = 95.24\end{aligned}$$

2. present value of \$100 2 years from now

first year

↓

$$[PV(1+r)](1+r)$$

$$PV = 100/(1+r)^2$$

at 5%

$$PV = 100/(1+0.05)^2 = 90.70$$

3. present value of a payment w "t" years from now (w_t)

$$PV = w_t/(1+r)^t$$

4. present value of stream of payments

$$PV = \frac{w_0}{(1+r)^0} + \frac{w_1}{(1+r)^1} + \frac{w_2}{(1+r)^2} + \dots + \frac{w_T}{(1+r)^T}$$

$$PV = \sum_0^T \frac{w_t}{(1+r)^t}$$

D. Wealth Maximization - College vs. Not

1. PV of college

$$PV^C = \sum_0^T \frac{w_t^C}{(1+r)^t}$$

2. High-School

$$PV^H = \sum_0^T \frac{w_t^H}{(1+r)^t}$$

3. go if:

a. $PV^C > PV^H$

b. $NPV = PV^C - PV^H > 0$

4. Some short-comings of the model

- a. T differs by occupation
- b. college as a consumption good
- c. income uncertainty
- d. appropriate interest rate?

all can be accounted for.

5. migration example

1. You are currently a rice picker in China that earns the equivalent of \$3000 plus room and board. Your wage grows at a rate of 5% per year. However, you are thinking about migrating from China to the United States. It will cost \$3000 plus you will have to work for 4 years for no wages other than room and board. After 4 years, your earnings will be \$3500 a year as a garment worker plus your room and board. Your salary will increase at a rate of 10% per annum. The annual discount rate is 5%, and your working life is 20 years.

A. What should be included in your calculation of the opportunity costs of migrating and why?

B. Show theoretically how you would calculate the present value of the income streams for the two occupations.

C. Employ the formulation in (B) above to calculate the present value of your earnings in the two proposed occupations; plot the present value of your yearly earnings over the twenty years in each career. Which occupation should you choose to maximize wealth?

$$PV^N=3000(20)$$

first four years

last 16 years

D. What other considerations, besides yearly earnings, might enter into your migration choice?

E. What is likely to happen to your likelihood of migrating if the discount rate increases.

II. The Wage-Schooling Locus and the Rate of Return to Schooling

A. The Wage-Schooling Locus - relationship between earnings and number of years of school



B. 3 Properties of Wage Schooling Locus

1. Upward-sloping - more educated earn more
2. slope of wage schooling locus: $\Delta w / \Delta s$
3. the wage schooling locus is concave - the gains from schooling decline for each additional year of schooling

C. The Marginal Return to Schooling

1. Percentage change in earnings

$$\frac{\% \Delta w}{\Delta s} = \frac{\Delta w / \Delta s}{w}$$

example for one more year of schooling:

$$(3000/1)/20000=0.15$$

2. marginal return is:

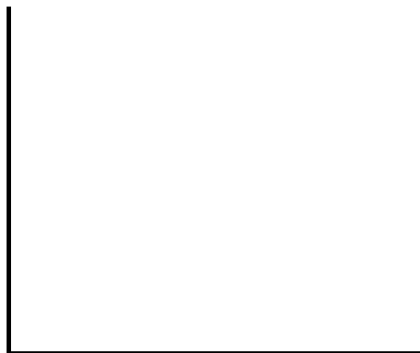
a. related to slope of wage-schooling locus

b. because slope of wage-schooling locus declines the marginal return declines

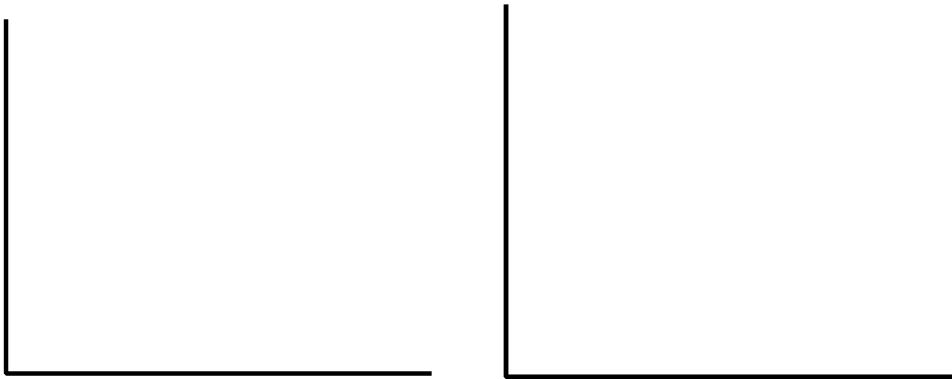
3. optimal stopping rule:

stop schooling when marginal return = r

graph for optimal years of schooling

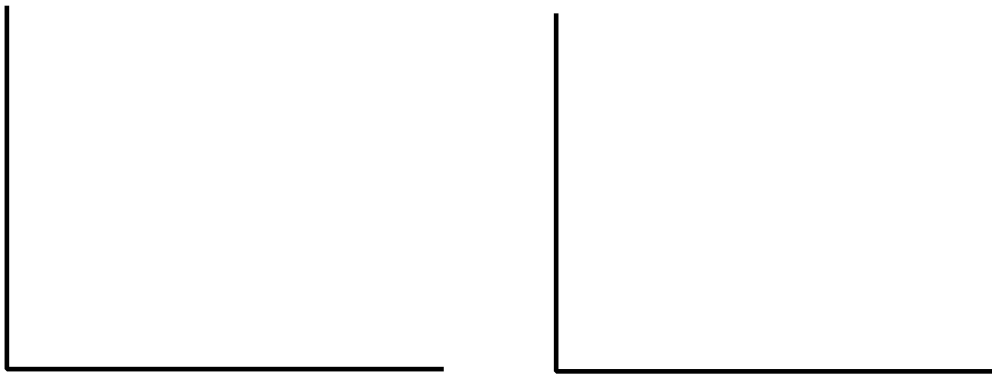


D. Differences in the rate of discount - same ability



if workers only differ in the rate of discount then an increase in earnings from education can be predicted by moving a long a given wage locus

E. Differences in ability (same discount)



if workers only differ in the rate of discount then an increase in earnings

1. it is much more difficult to estimate the returns to schooling when all workers have same rate of discount but have different abilities
2. whether more able workers get more or less education is unknown: ability increases both Δw and w - thus MRR schedule may increase or decrease

3. data on ability is rarely available; hence using data on earnings and schooling does not permit one to estimate return to schooling - show ability bias and implications

F. Estimates of the Return to Schooling

1. The log earnings equation

$$\log w = \alpha + \beta s + \text{other variables}$$

$$\beta = \Delta \log w / \Delta s = \% \Delta w / \Delta s$$

use calculator to verify 1st is equal to 2nd for small changes

2. β is the estimate of return to education in the absence of ability bias

3. Typical estimates are between 0.05 and 0.10 - good investment