Lec6: Human Capital

Labor Economics,Fall 2023

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11/16/2023

Nanjing University

Human Capital Investment

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  2. Expect to recoup in some future period
- Human Capital Investments
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  2. Health
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  4. Job search
- Special feature: investment embodied in people

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- Stock of physical capital:
  - natural resources, buildings, machines
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  - Germany/Japan after WWII

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Three Stages of H.C.Investment

- Early childhood
  - Skill acquisition determined by others
    - Parental resource and guidance
    - Environment
    - Early school experience
- Teenagers and young adults as full-time students
  - Formal schooling
- Adults, after entering the labor market
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The typical questions

- Why some guys obtain a lot of schooling and others drop out at early age?
- How does the rate of return to schooling compare with the rate of return on other investments?
- How workers make their investments decisions and investigates how these choices influence the evolution of earnings over the life cycle?

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- Schooling decision
  - College vs. high school
  - Continuous schooling choice
- The signaling model
  - Is the investment socially worthwhile?
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The distribution of education in U.S.

TABLE 6-1 **Educational Attainment of U.S. Population, 2007 (Persons Aged 25 and over)**

Source: U.S. Bureau of Labor Statistics, *Annual Demographic Supplement of the Current Population Surveys*, March 2007.

	Highest Grade Completed (Percentage of Population in Education Category)					
Group	Less Than High School	High School Graduates	Some College	Associate Degree	Bachelor's Degree	Advanced Degree
All Persons	12.7%	33.2%	16.7%	8.6%	18.9%	9.9%
Gender:						
Male	13.3	33.4	16.1	7.7	18.7	10.8
Female	12.2	33.0	17.3	9.5	19.0	9.0
Race/ethnicity:						
White	8.3	33.4	17.4	9.1	20.8	11.1
Black	15.0	38.6	18.9	8.8	13.1	5.7
Hispanic	36.6	31.4	13.0	6.2	9.4	3.3

Importance of Education Attainment

- Education is strongly correlated with
  1. labor force participation rates
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Labor Market Characteristics in U.S.

TABLE 6-2 Labor Market Characteristics, by Education Group, 2007 (Persons Aged 25–64)

Sources: U.S. Bureau of Labor Statistics, *Annual Demographic Supplement of the Current Population Surveys*, March 2007.

		Less Than High School	High School Graduates	Some College	College Graduates
All workers:	Labor force participation rate	62.9	76.0	81.3	85.9
	Unemployment rate	8.6	4.9	3.7	1.8
	Annual earnings (in $1,000)	22.8	33.0	39.3	68.2
Gender:					
Men	Labor force participation rate	75.6	83.6	87.4	92.5
	Unemployment rate	8.4	5.6	3.9	1.9
	Annual earnings (in $1,000)	26.2	39.6	47.2	84.8
Women	Labor force participation rate	48.1	68.1	76.1	79.7
	Unemployment rate	8.8	3.9	3.5	1.8
	Annual earnings (in $1,000)	16.8	25.0	31.9	50.6
Race/ethnicity:					
White	Labor force participation rate	57.7	76.6	81.2	86.2
	Unemployment rate	8.8	4.4	3.2	1.7
	Annual earnings (in $1,000)	26.1	35.2	49.9	70.7
Black	Labor force participation rate	53.7	71.8	80.9	88.2
	Unemployment rate	14.9	7.8	5.6	2.4
	Annual earnings (in $1,000)	19.3	28.0	34.3	55.3
Hispanic	Labor force participation rate	69.8	79.1	82.9	85.7
	Unemployment rate	7.3	3.9	4.4	2.1
	Annual earnings (in $1,000)	21.6	28.8	35.2	55.7

The Schooling Model

- Objective: Maximize the present value of lifetime earnings
- Benefits of education and training only come from the investment aspect
- "Side effects"of education in increasing utility are ignored in the model
  - Consumption aspect
  - Advantage in the marriage market

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- Direct expenses:
  - Tuition
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- Foregone earnings:
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Consider the Decision of College

- Consider a high school graduate at 18 years
- He earns W_{HS} if quitting school after high school
- If he goes to college,
  - pays direct cost H
  - delays labor market entry by 4 years
  - earns W_{COL} after college

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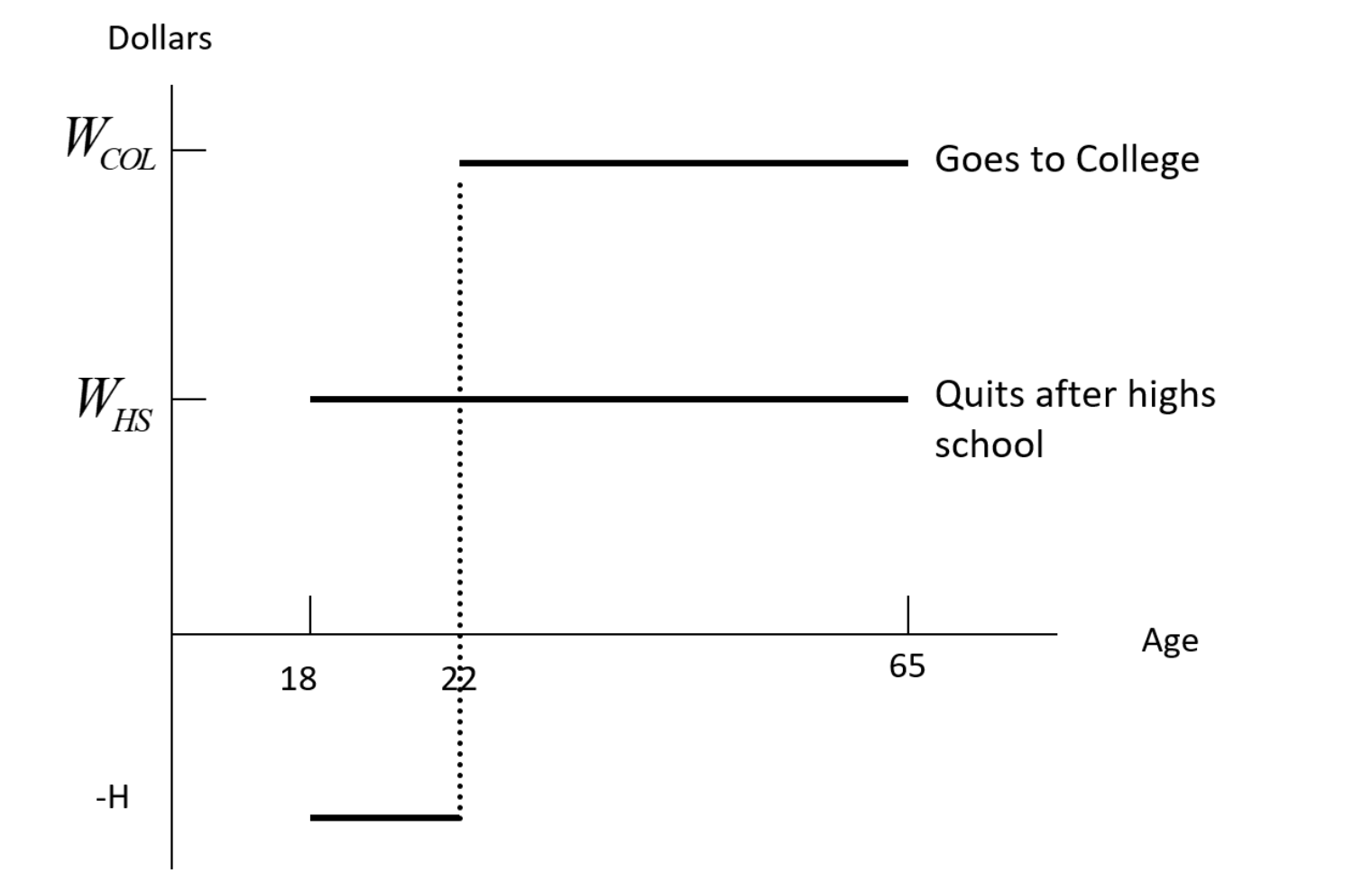
Potential Earnings Stream



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$$PV_{col} = -H - \frac{H}{(1+r)} - \frac{H}{(1+r)^2} - \frac{H}{(1+r)^3} + \frac{W_{col}}{(1+r)^4} + \frac{W_{COL}}{(1+r)^5} + ... + \frac{W_{cot}}{(1+r)^{41}}$$

$$PV_{HS} = W_{HS} + \frac{W_{HS}}{(1+r)} + \frac{W_{HS}}{(1+r)^2} + ... + \frac{W_{HS}}{(1+r)^{41}}$$

- A person chooses to go to college only if

$$PV_{COL} > PV_{HS}$$

Benefits and Costs of College

- Benefits of College

$$PVB_{COL} = \frac{W_{COL} - W_{HS}}{(1+r)^4} + \frac{W_{COL} - W_{HS}}{(1+r)^5} + ... + \frac{W_{COL} - W_{HS}}{(1+r)^{41}}$$

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- The income flow may not be flatted, but a increasing profile.
  - The earnings streams are not constant
- When there are more than two schooling options.
- The "stopping rule" tells the individual when it is optimal to quit school and enter the labor market.

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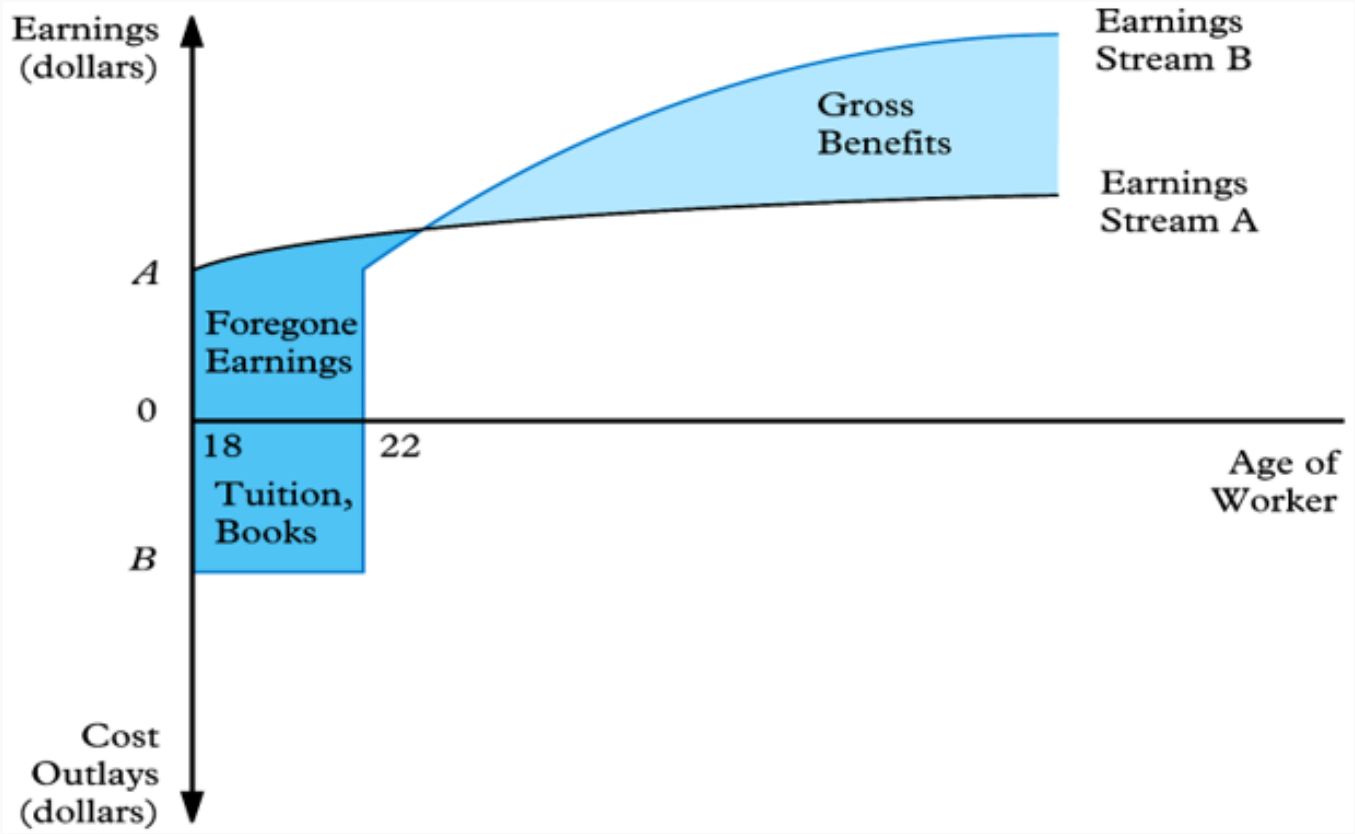

Continuous Schooling

- The Wage-Schooling Locus
- Three Properties:
  a) Upward sloping
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  c) Concave: Diminishing marginal returns to human capital accumulation

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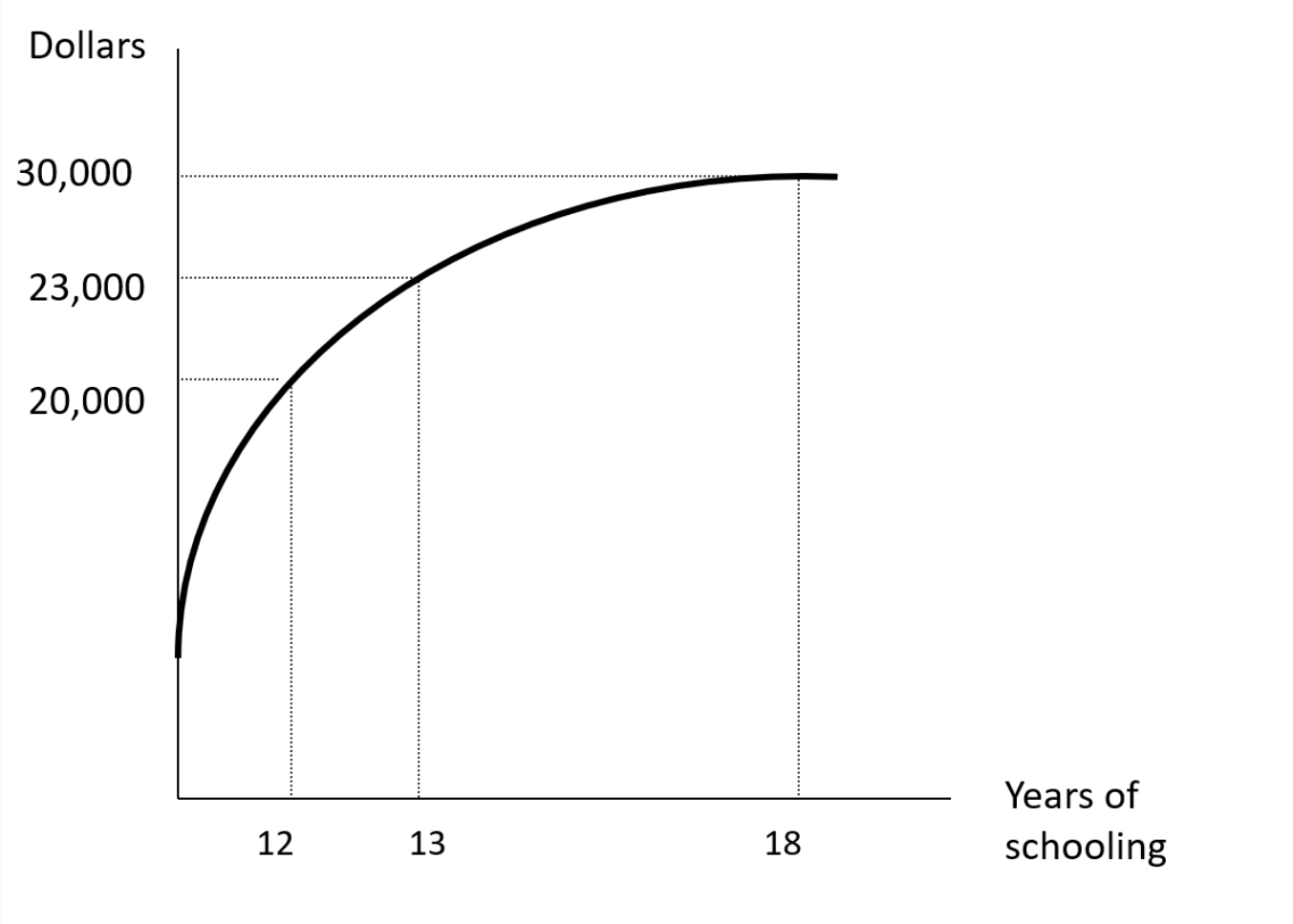

Optimal Acquisition of Schooling

- Consider an additional year of schooling
- MB: Present value of a stream of extra annual earnings from the extra schooling
- MC: costs of an extra year of schooling
- Optimal schooling: MB=MC
  - Higher MC reduces schooling
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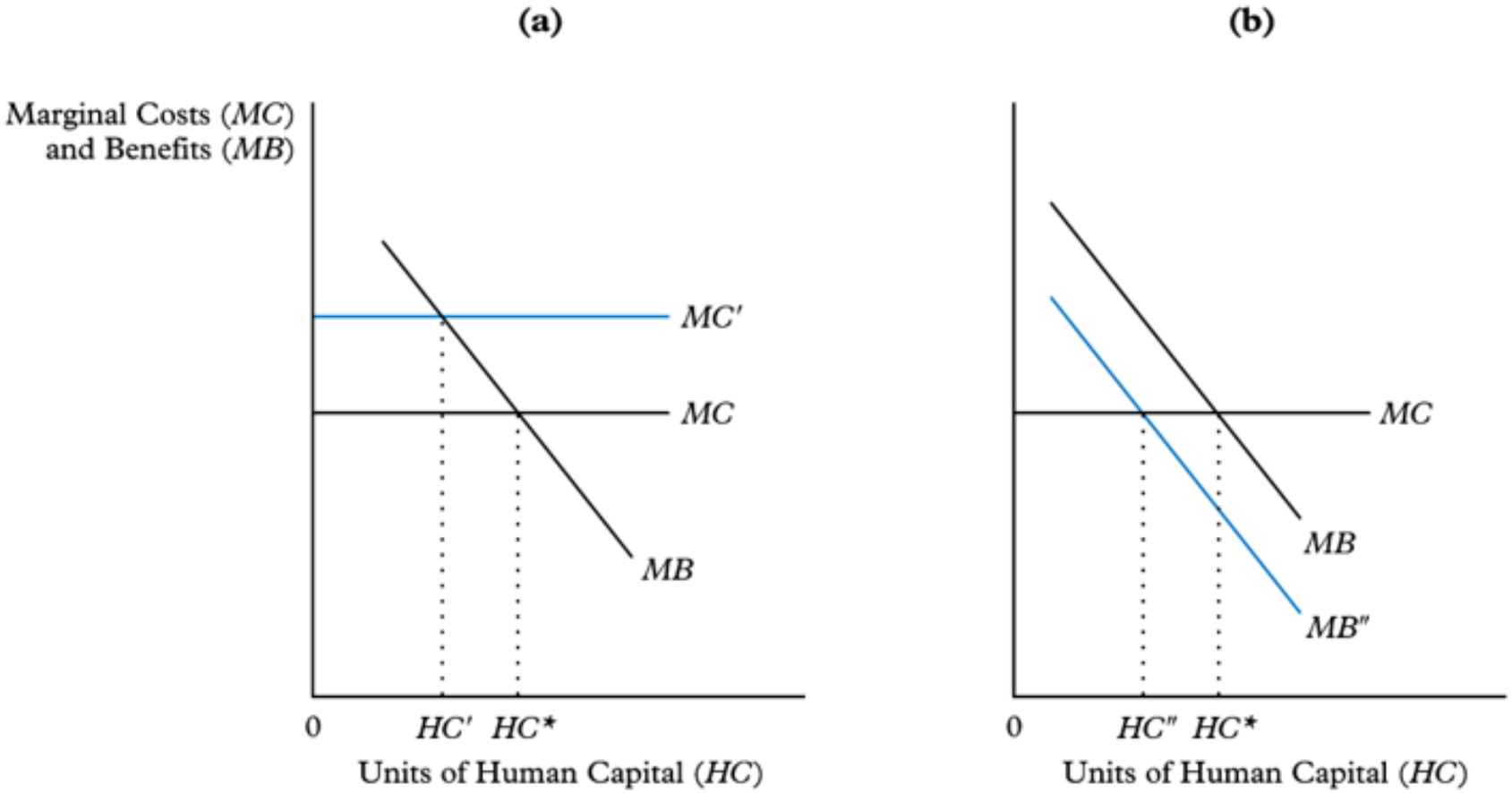
Figure 9.1 The Optimum Acquisition of Human Capital



The Rate of Return to Schooling

- Definition: d(lny)/ds: percentage change in earnings associated with an additional year of schooling
- Also called marginal rate of return to schooling
- On locus, it must decline as schooling increase
- A central concept in empirical research
- Often compared with the rate of return to capital to determine over/under investment in human capital

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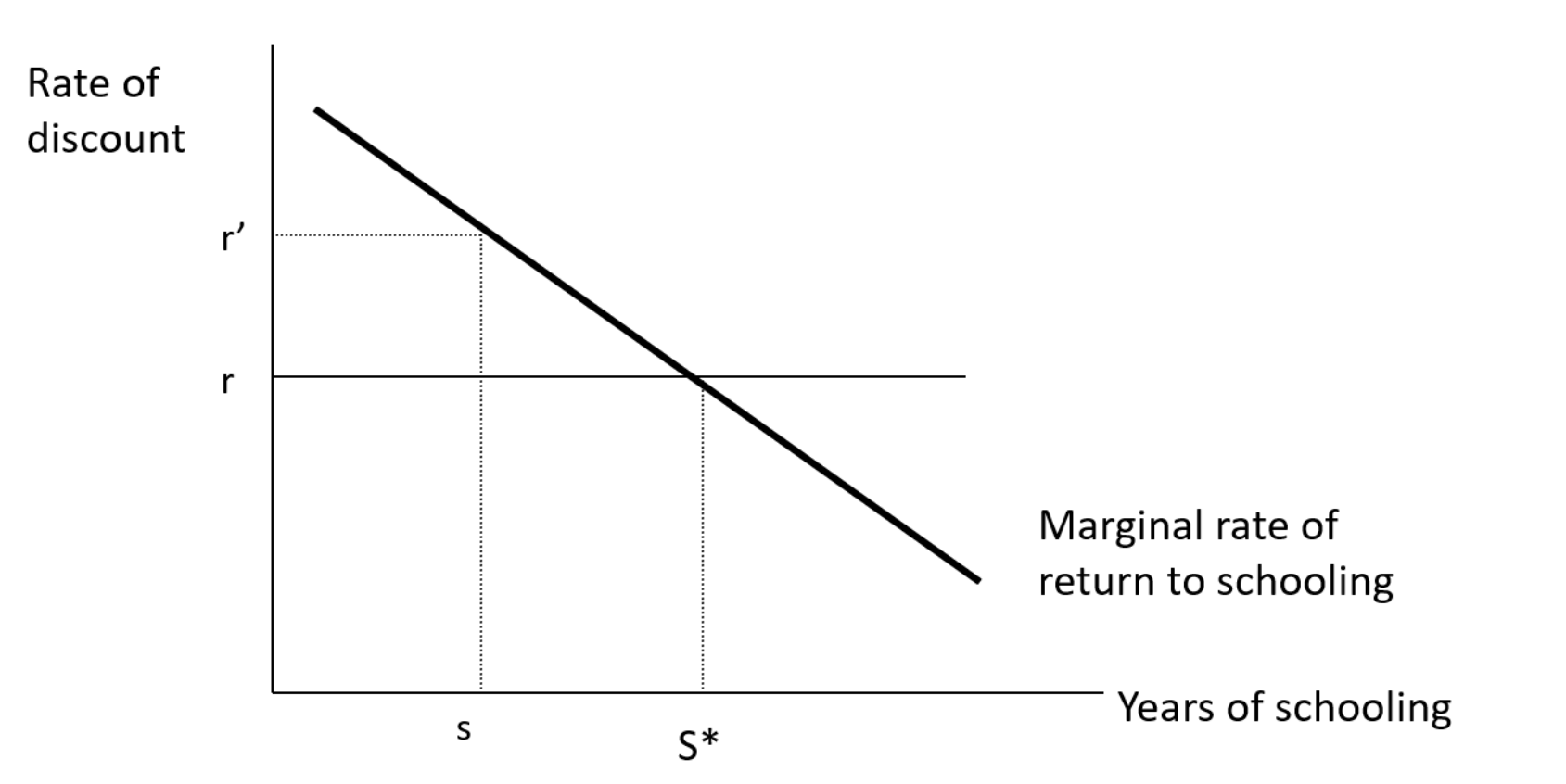

If the worker's rate of discount equals r, then it is optimal for the worker to choose S^*.

Education and Earnings

- Workers have different levels of schooling for two reasons:
  - Different rates of discount
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- Different educational levels lead to different incomes
- Can we calculate rates to education based on observed differences in wages and schooling?

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Differences in the Rate of Discount

- A and B's marginal rates of return to schooling are the same
  - Face same wage-schooling locus
- A faces a higher discount rate than B due to
  - more present-orientedness
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- Result: A choose 11 years of schooling; B chooses 12 years of schooling
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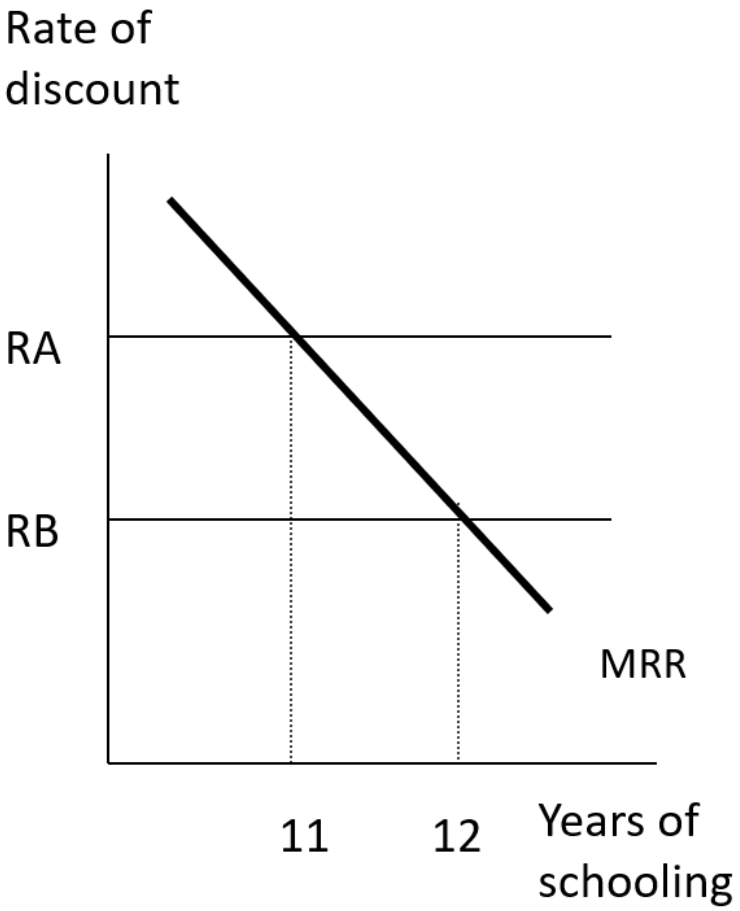

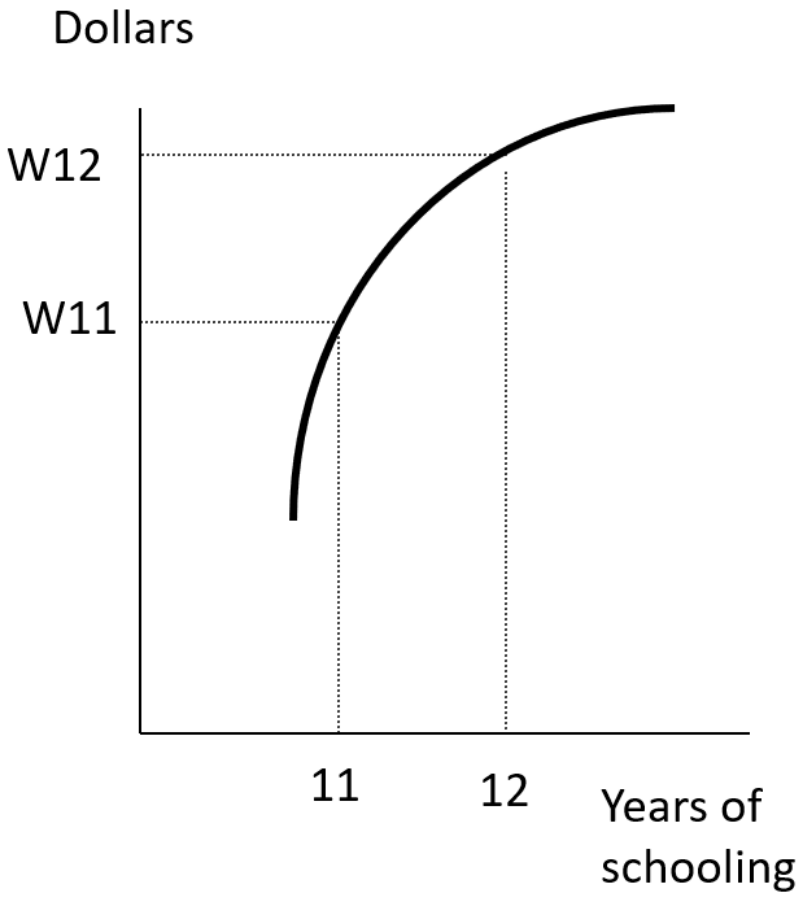

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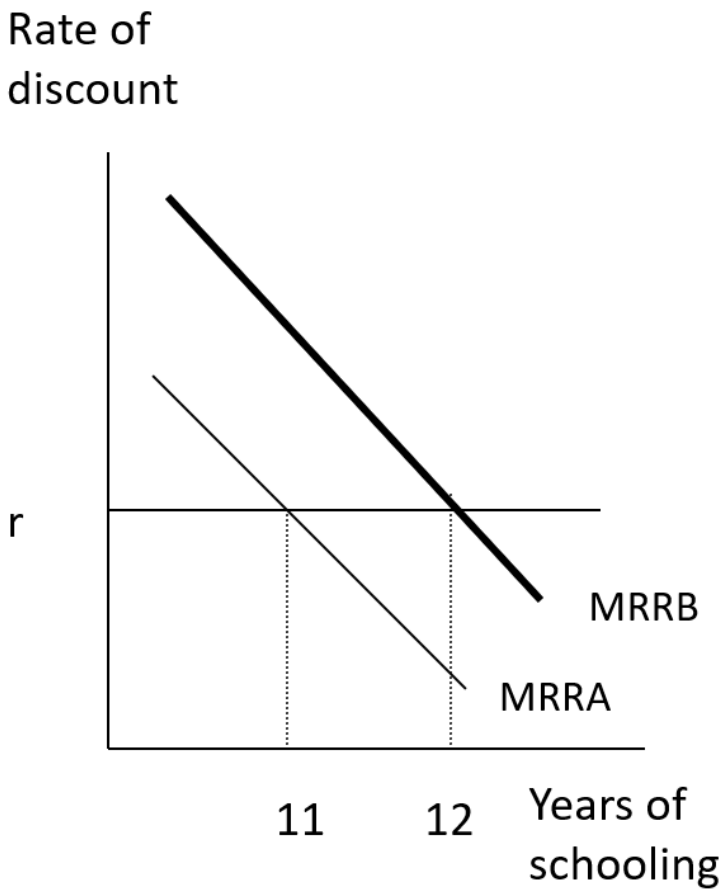

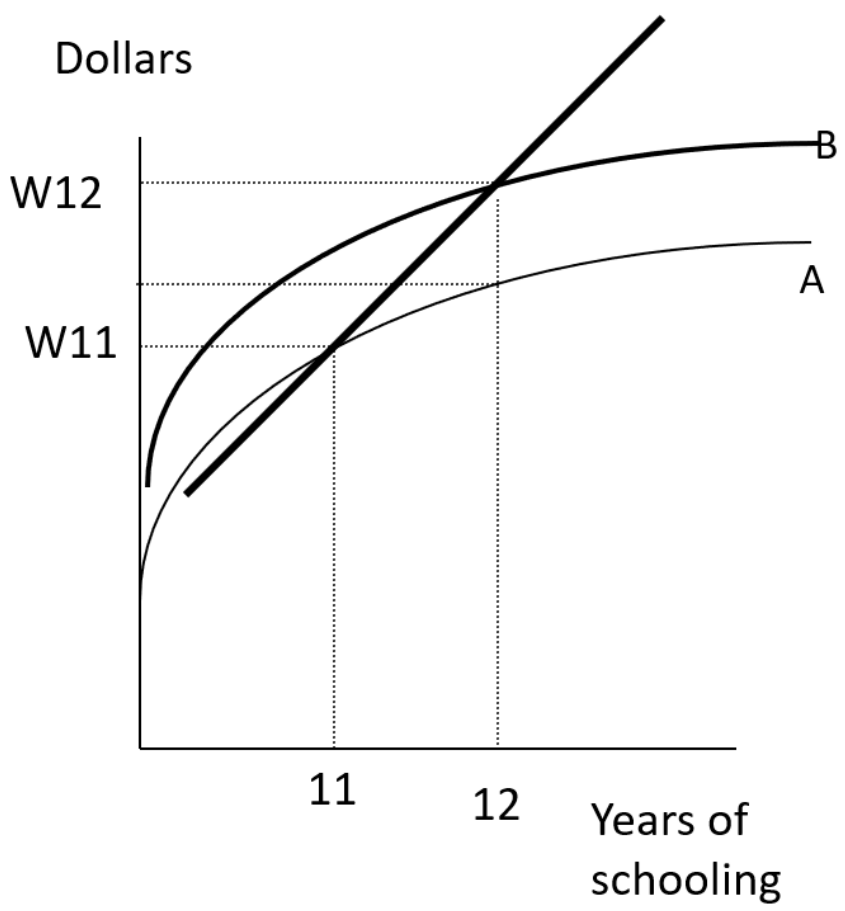

Why Do We Care About the Bias

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- Setting:
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  c) Equal proportions
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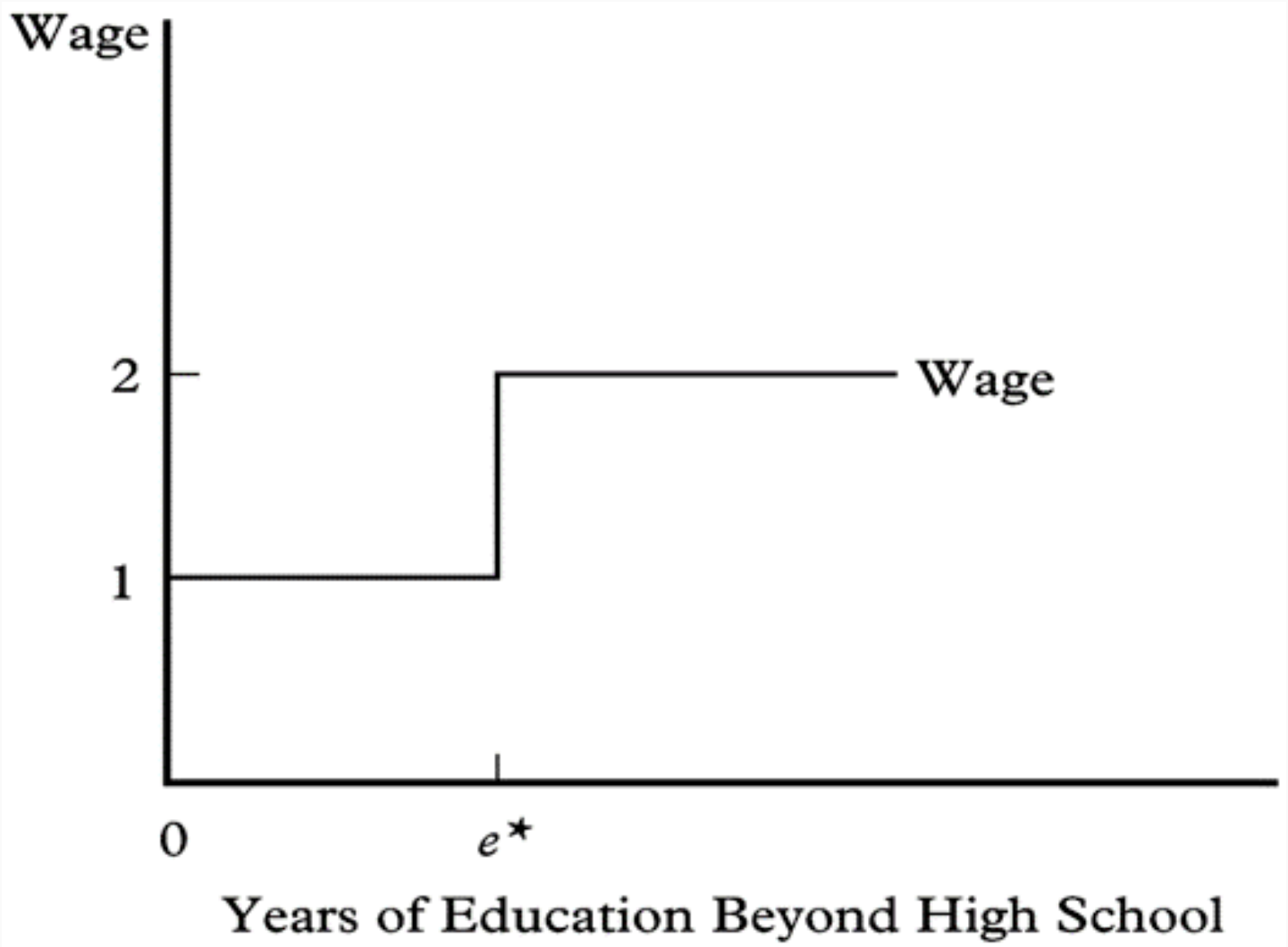

How Does the Signal Work?

- Costs of schooling
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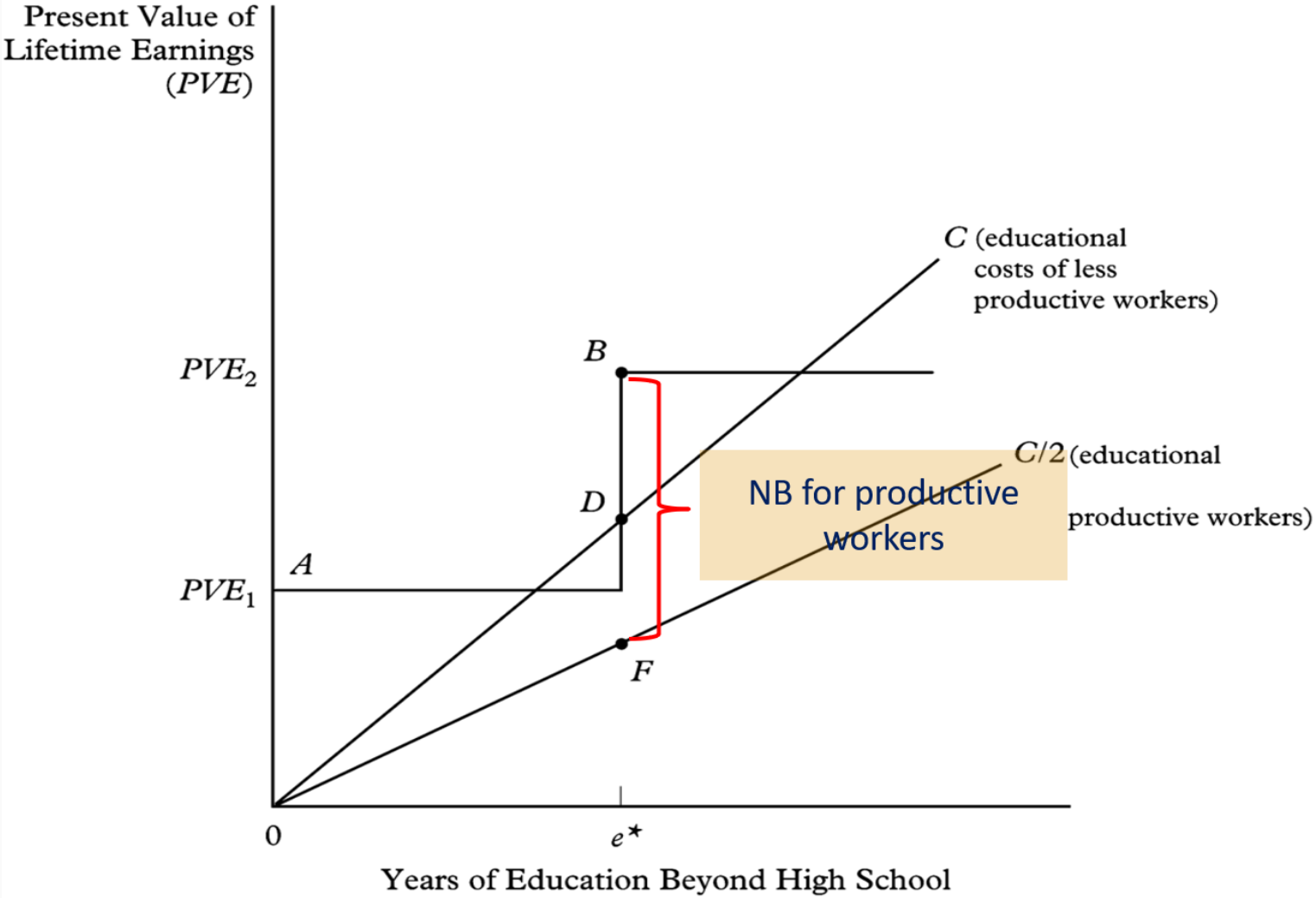

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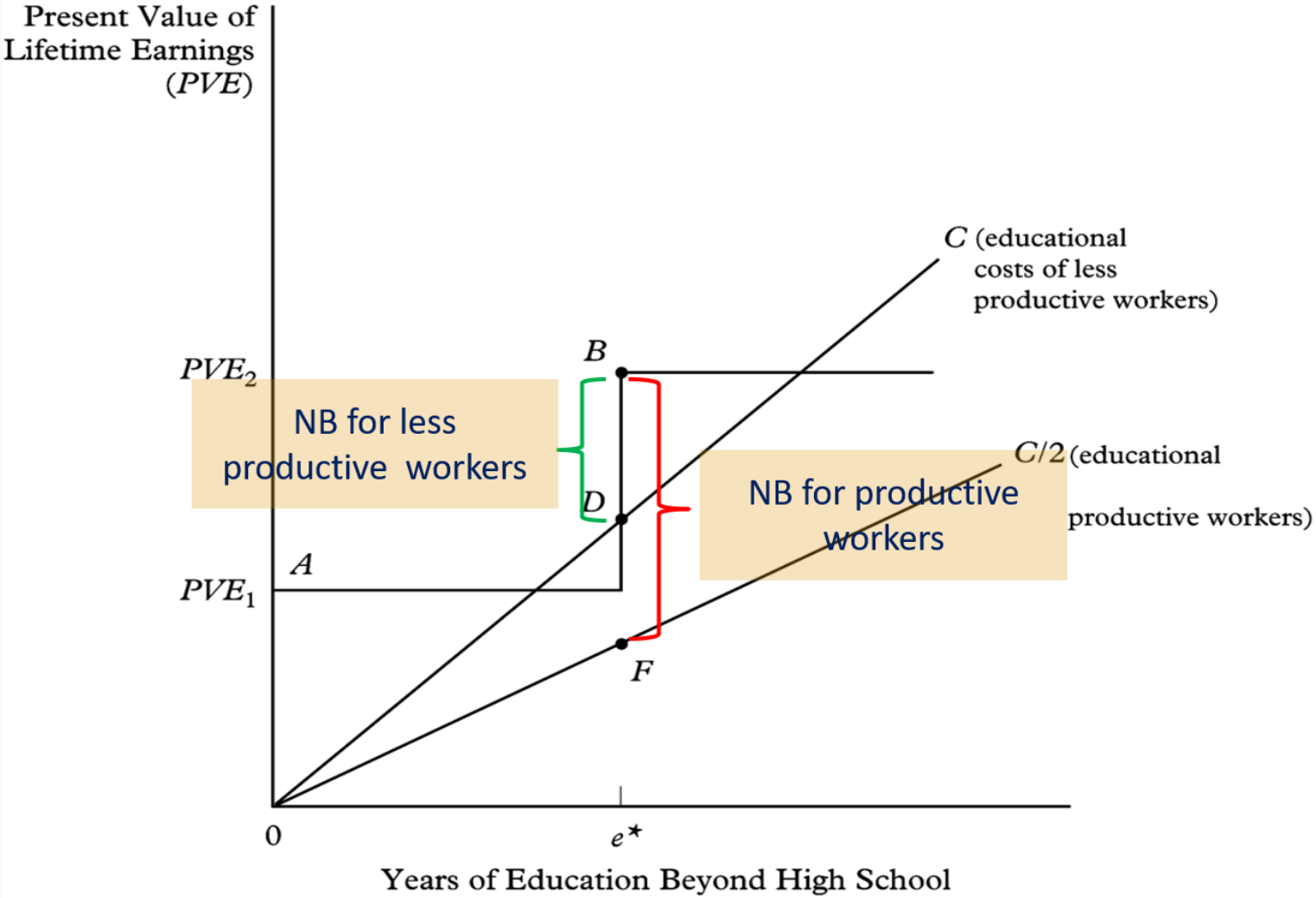

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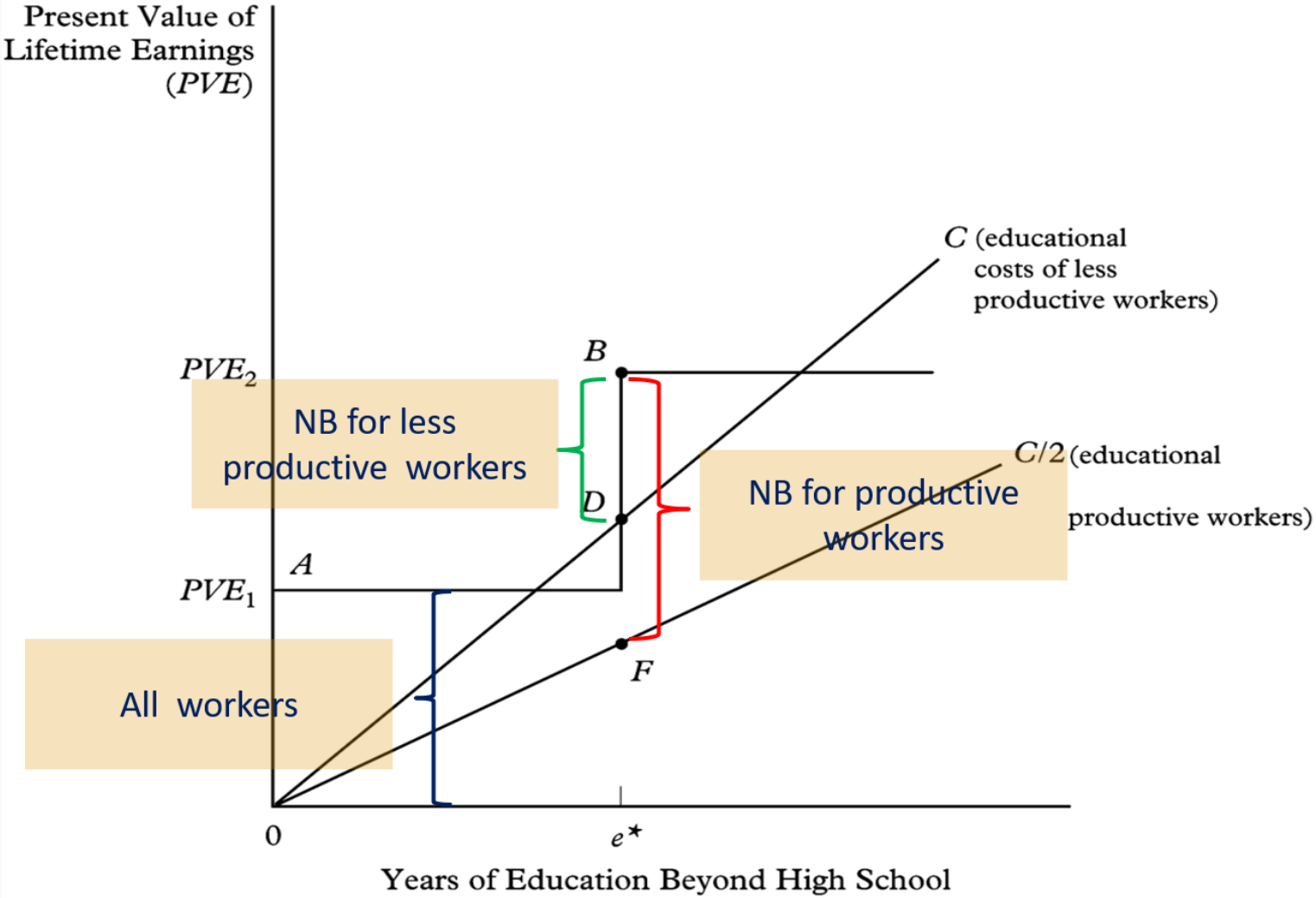

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  Once workers acquired, enhances productivity equally in all firms.

  a) English

  b) Computer Skill

- Specific training:

  enhances productivity only in the firm where it is accquired and the value is lost once leaving.

  a) Drive a tank in the army

  b) Some specific computer languages

Who pays for

- Whether workers or firms pay the costs of OJT
- The worker will pay for general training through low wages during the training period.
- The firm must bear the cost of specific training.

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Some Implications for Specific Trainings

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- So ST can be explained some phenomenon as following
  a) "Last hired, first fired"
  b) Industrial transition and layoffs

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