Human Capital

- Wages will vary among workers because jobs are different.

- Wages will also vary workers because workers are different.

- We bring into the labor market a unique set of abilities and acquired skills, or human capital.

- This chapter discusses how we choose the particular set of skills that we offer to employers and how our choices affect the evolution of earnings over the working life.

- People acquire most of the human capital in school and in formal and informal on-the-job training programs.

- The accumulation of education is the key factor for determining wages of workers.

- Some high school graduated decide to enter college while some of them decide to enter labor market → why is it?

- We consider schooling choice by a person as an investment.

- Therefore, we need to consider the rate of return to schooling comparing with the rate of return on other investment → human capital approach (cost & benefit analysis).

Some stylized facts about education in the labor market

- The differences in educational attainment among workers are significant.

- Education is strongly correlated with labor force participation rates, unemployment rates, and earnings → higher level of education is associated with high earnings.

- In the Korean labor market, average monthly wages of workers having high school diploma are 1.4 million Korean wons.

- For college graduate, average monthly wages are 2.4 million Korean wons.

The Schooling Model

- Consider the time when high school graduates are deciding whether they enter college.

- As a rational person, a high school graduate is maximizing his or her own utility by considering cost and benefit from college education.

- Cost associated with college education includes not only 4-year tuition but also forgone compensation in the labor market.

- All of the cost and benefits should be transformed into the sum of present values.

- Assume that an 18-year-old male who has just received his high school diploma and who is contemplating whether to enter the labor market or attend college.

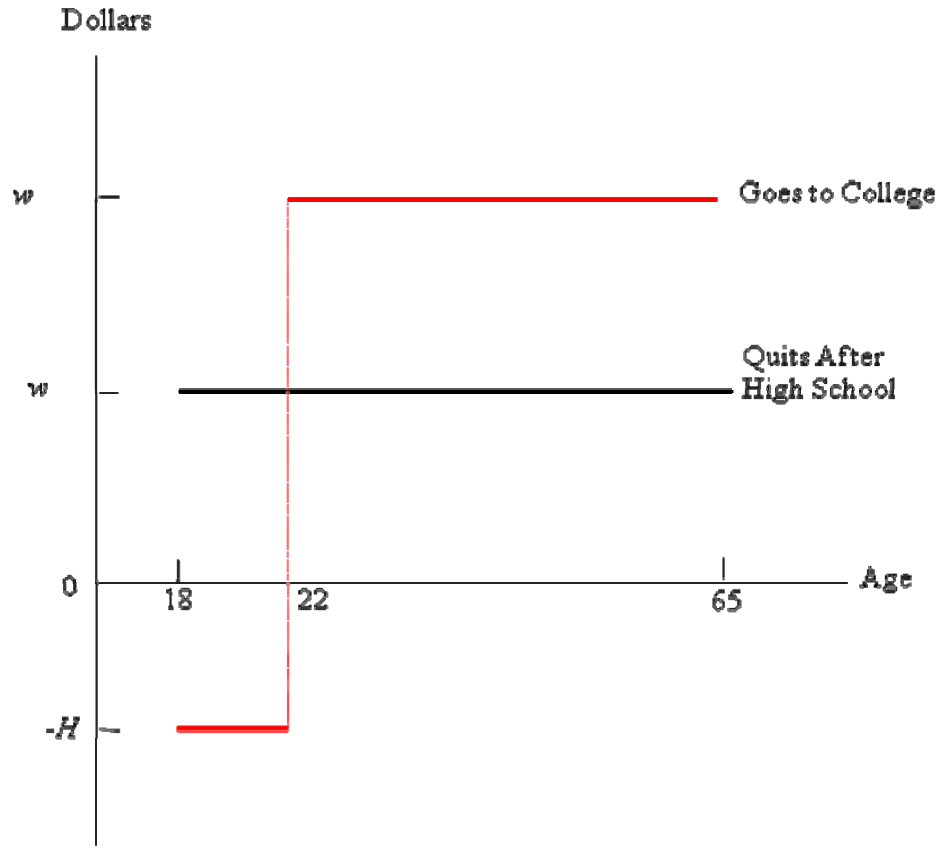
- If he gets job, we assume that the person is able to work at his age of 65.

- High school graduate who enters labor market is assumed to earn W_{HS} until retirement.

- For high school graduate who decides to enter college, one spends 4 years and earns W_{COL} until retirement.

- The sum of sum of forgone wages and college tuition incurs the cost of H.

[Figure 1] Potential Earnings Streams Faced by a High School Graduate



- The present value of the earnings streams if the worker gets only a high school education is

$$PV_{HS} = W_{HS} + W_{HS}/(1+r) + W_{HS}/(1+r)^2 + \ldots + W_{HS}/(1+r)^{46}$$

- The present value of the earnings streams if the worker gets a college diploma

$$PV_{COL} = -H - H/(1+r) - H/(1+r)^2 - H/(1+r)^3 + W_{HS}/(1+r)^4 + \ldots + W_{HS}/(1+r)^{46}$$

- If $PV_{COL} > PV_{HS}$ then the person decides to enter college → this decision will vary for each of high school graduate.

- In the schooling model, rate of discount (denoted by “r”) plays a crucial role.

- The higher rate of discount, the less people tend to invest in college education.

- The rate of discount depends on how we feel about giving up some of today’s consumption in return for future rewards → it is interpreted as “time preference”

- Persons who are pre present oriented have a high discount rate and would be less likely to invest in schooling.

- Sometimes the person's rate of discount rate equals the market rate of interest, the rate at which funds deposited in financial institutions grow over time.

- The higher in interest rate leads to increase the cost associated with college education → reduce person's decision to obtain college education.

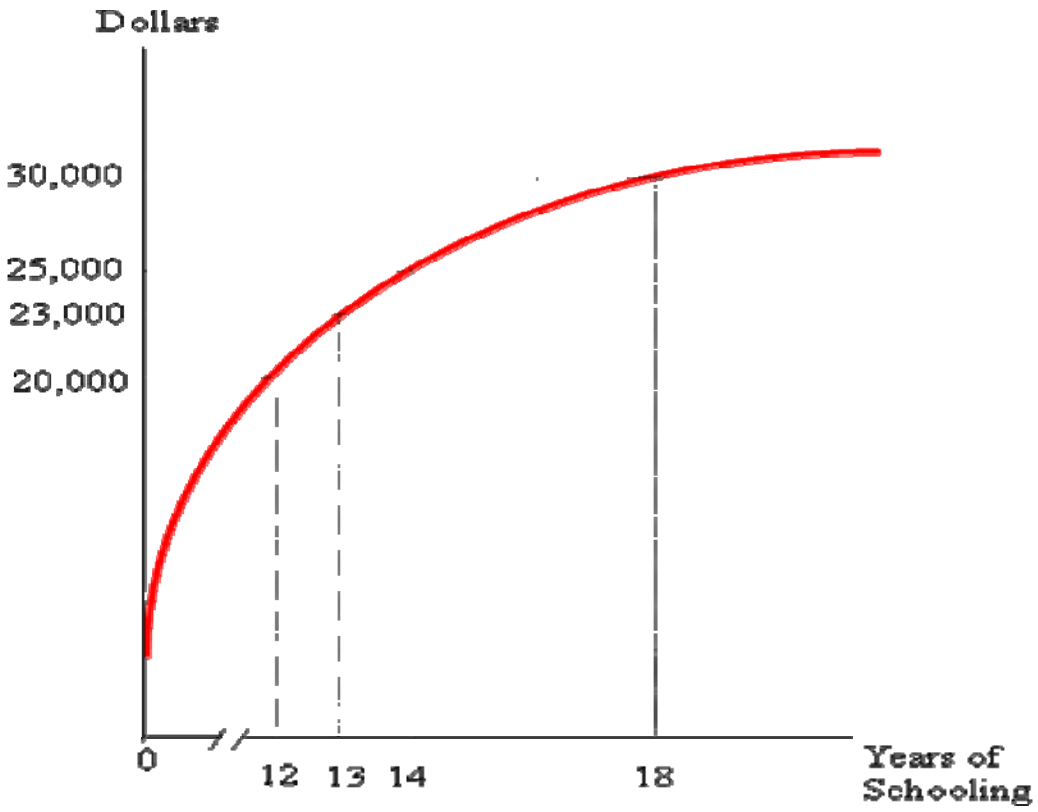
The Wage-Schooling Locus

- A person chooses the level of schooling that maximizes the present value of earnings from acquiring education.

- We are able to observe that as level of education increases the wages of workers increase as well.

- Wage-schooling locus is defined as showing the relationship between the given level of education and the amount of wages that workers can earn.

[Figure 2] Wage-Schooling Locus



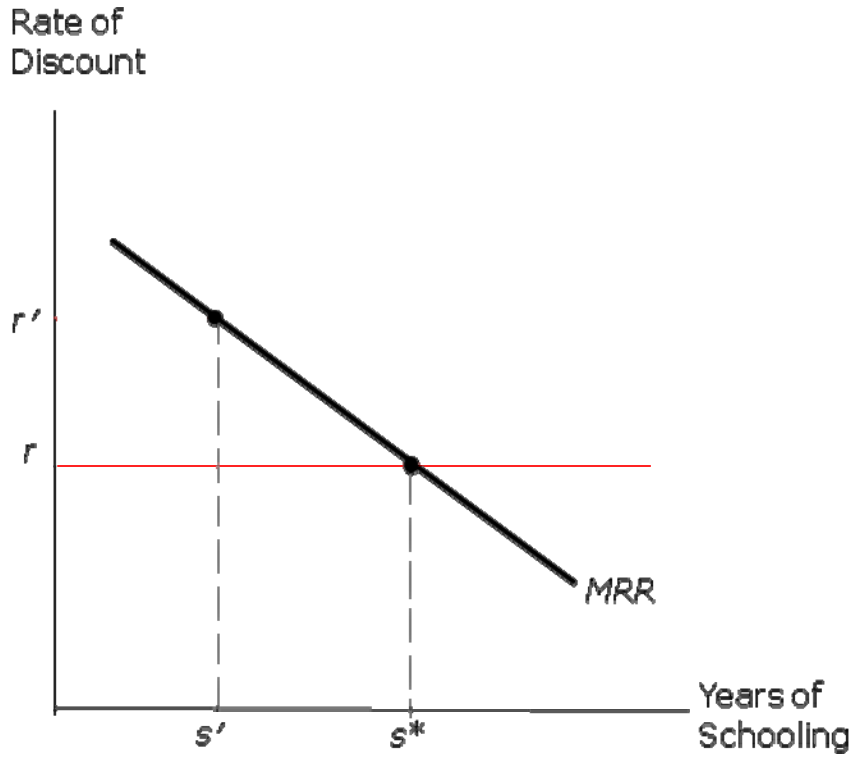
Three important properties from wage–schooling locus

(1) The wage–schooling locus is upward sloping → more educated workers must earn more as long as educational decisions are motivated only by financial gains.

(2) The slope of the wage–schooling locus tells us by how much a worker's earnings would increase if he were to obtain one more year of schooling → measure of "the rate of return" to schooling.

(3) The wage–schooling locus is concave → additional year of schooling decline as more schooling is acquired, that is the law of diminishing returns applies to human capital accumulation.

[Figure 3] The Schooling Decision

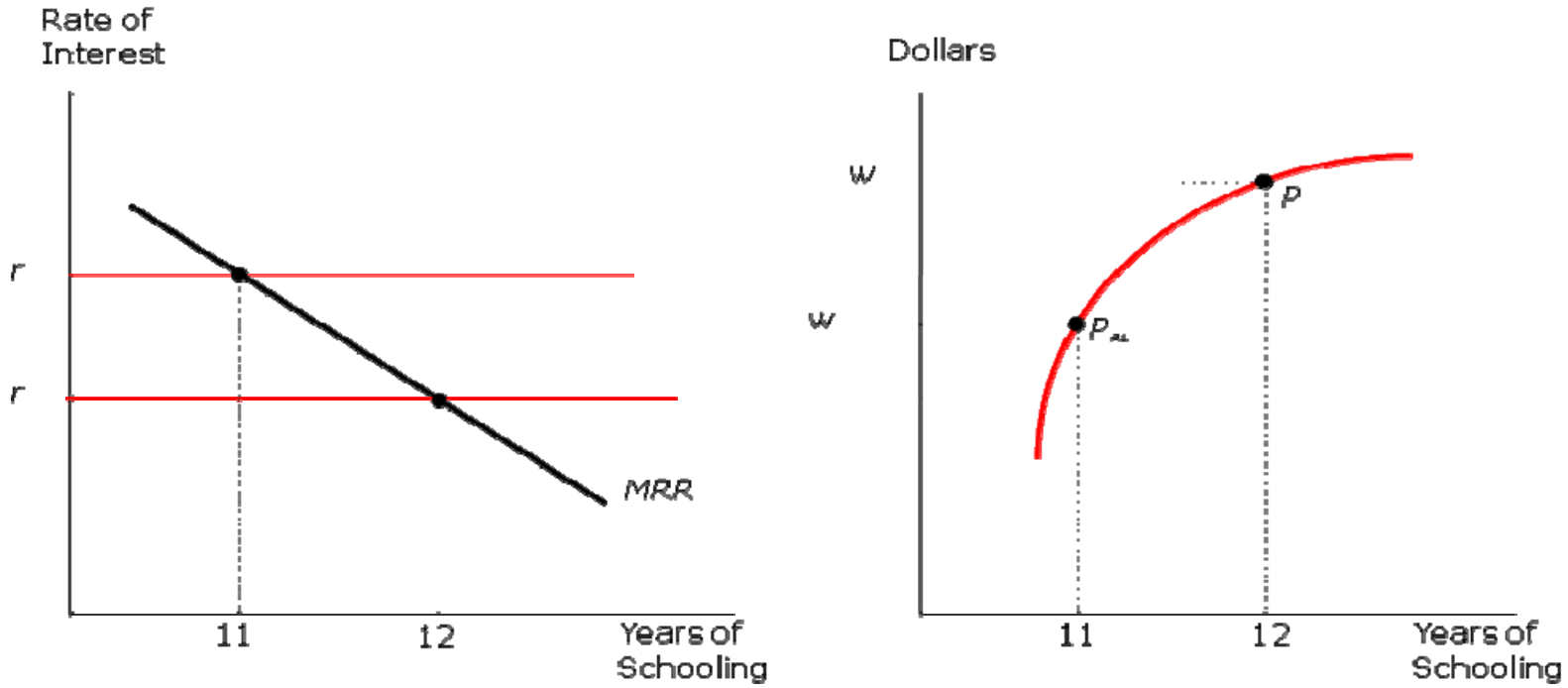


- The *MRR* schedule gives the marginal rate of return to schooling, or the percentage increase in earnings resulting from an additional year of school.

- A worker maximizes the present value of lifetime earnings by going to school until the marginal rate of return to schooling equals the rate of discount.

- A worker with discount rate r goes to school for s^* years.

[Figure 4] Schooling and Earnings When Workers Have Different Rates of Discount

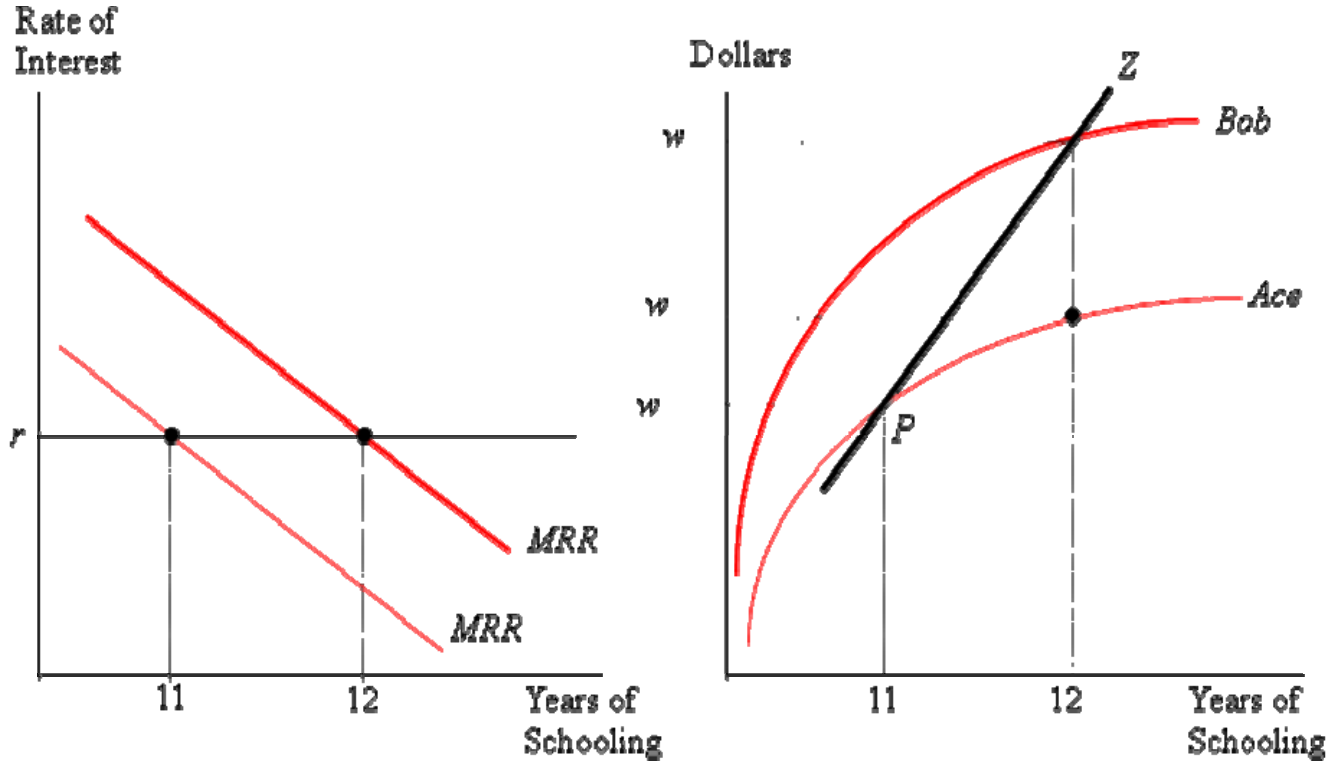


- Consider a labor market with two workers who differ only in their discount rates.

- A person with relatively higher discount rate tends to invest less in educational accumulation.

- Therefore, a person with relatively higher discount rate tends to earn less than a person with lower discount rate in the labor market.

[Figure 5] Schooling and Earnings When Workers Have Different Abilities



- Consider the case where workers have different abilities given the same levels of discount rates.

- It is assumed that higher ability levels shift the marginal rate of return schedule to the right.

- Difference in ability influences the wages of workers in two different ways.

- First, it causes the difference in the level of education, leading to difference in wages

- Second, it generates the difference of wages even in the same level of education → difference in productivity.

Estimating the Rate of Return to Schooling

- The typical study estimates a regression of the form:

  log w = a + b*schooling +c*other factors +e

- The estimated coefficient “b” gives the percent wage differential between two workers who differ by 1 year of schooling, holding other factors constant.

- It is typically interpreted as the rate of return to schooling.

Problem with Estimating Rate of Return to Schooling

- If there are unobserved ability differences in the population, earnings differentials across workers do not estimate the returns to schooling → so called “ability bias”

- As long as the workers lie on the same wage–schooling locus, the percentage wage differential between two workers who differ in their educational attainment correctly estimates the rate of return to schooling.

- More able workers choose college education → affects wage both by difference in educational attainment and difference in ability given the same level of education → what is solution(s)?