

Explaining wage differentials

Labor Economics

VSE

March 24, 2010

Exam

- ▶ April 7, 2010
- ▶ Class-time

- ▶ Combination of
 - ▶ Multiple choice questions
 - ▶ Problem-to-solve's
 - ▶ Definitions and intuitions



Why are wages different among people?

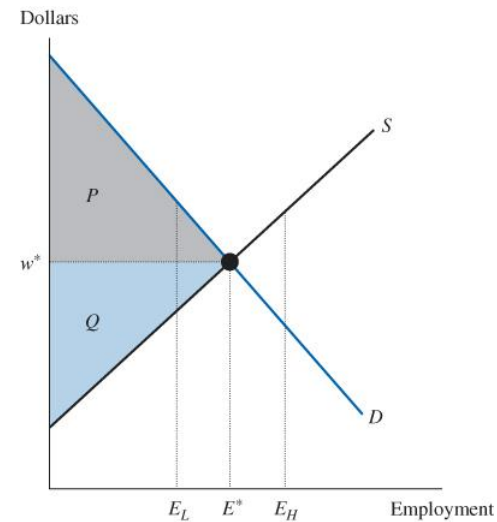
The whole of the advantages and disadvantages of different employment of labour and stock must, in the same neighbourhood, be either perfectly equal or continually tending to equality. If in the same neighbourhood there was any employment either evidently more or less advantageous than the rest, so many people would crowd into it in the one case, and so many would desert it in the other, that its advantages would soon return to the level of other employments. This at least would be the case in a society where things were left to follow their rational course, where there was perfect liberty and where everyman was perfectly free both to choose what occupation he thought proper, and to change it as often as he thought proper.

Adam Smith (1776)



Why do wages vary?

- ▶ Education and Human Capital
- ▶ Work Environment
- ▶ Discrimination
- ▶ Short term contracts



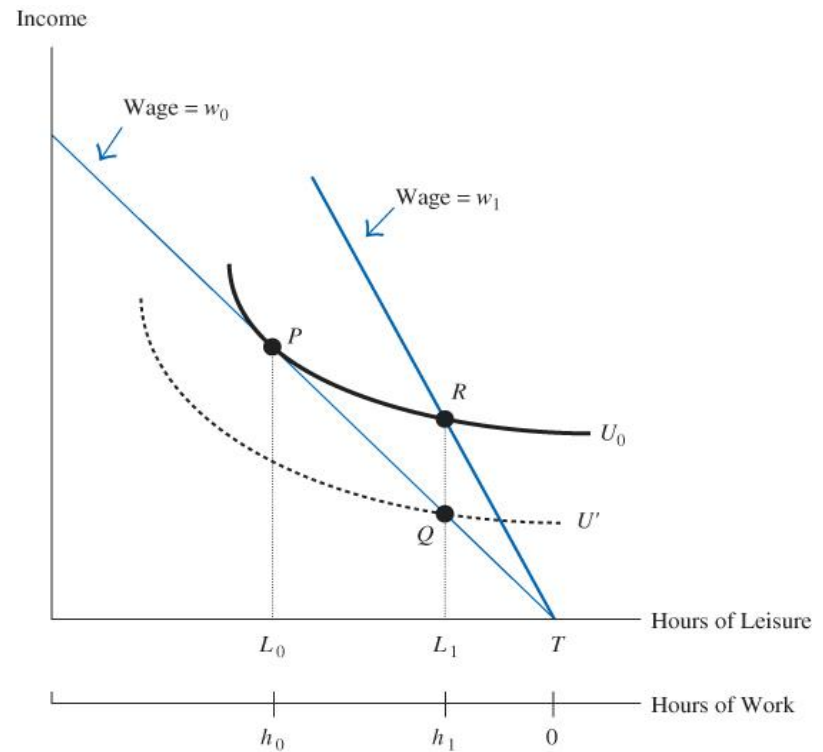
Short-term Contracts

- ▶ Attract people from Non-participants
- ▶ Attract people from other firms



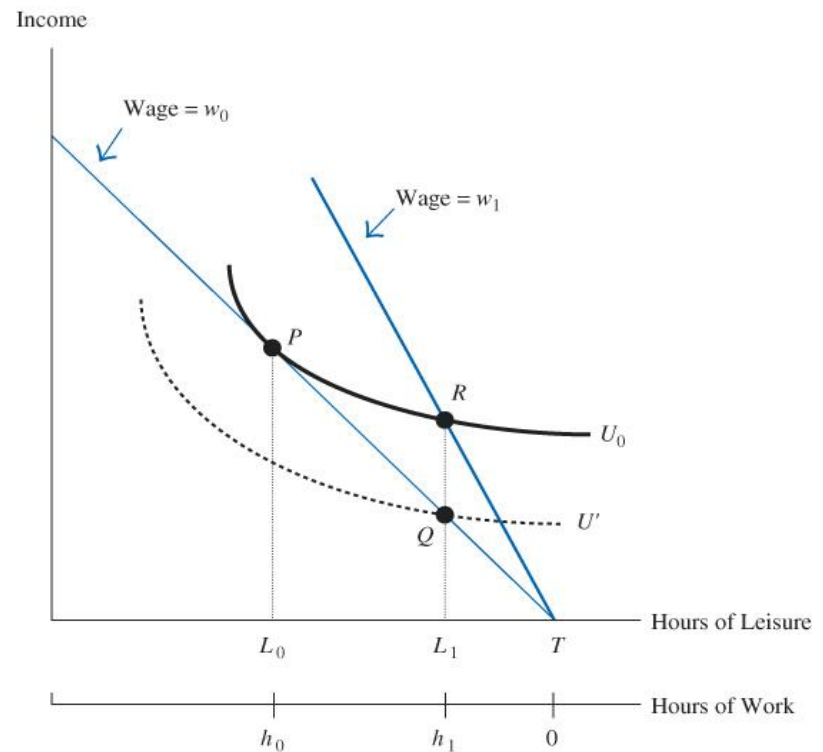
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Short-term Contracts

- ▶ Attract people from Non-participants
- ▶ Attract people from other firms



- ▶ What if the unemployment is high?



Work Environment

- ▶ Pollution
- ▶ Risks
- ▶ Geography
- ▶ ... and the like



A Model of Compensating Differentials

Setup:

- ▶ The utility function is $U(c, l, Z)$.

$$\frac{\partial U(c, l, Z)}{\partial Z} \geq 0$$

- ▶ Firm A offers (w_A, Z_A)
- ▶ Firm B offers (w_B, Z_B)

$$w_A = w_B$$
$$Z_A > Z_B$$

$$\Rightarrow V(w_A, Z_A) > V(w_B, Z_B)$$



A Model of Compensating Differentials

- ▶ $V(w_A, Z_A) - V(w_B, Z_B) > 0$

Firm B calculates that it needs to raise wages to equalize utility:

$$V(w_A, Z_A) = V(w_B^N, Z_B)$$

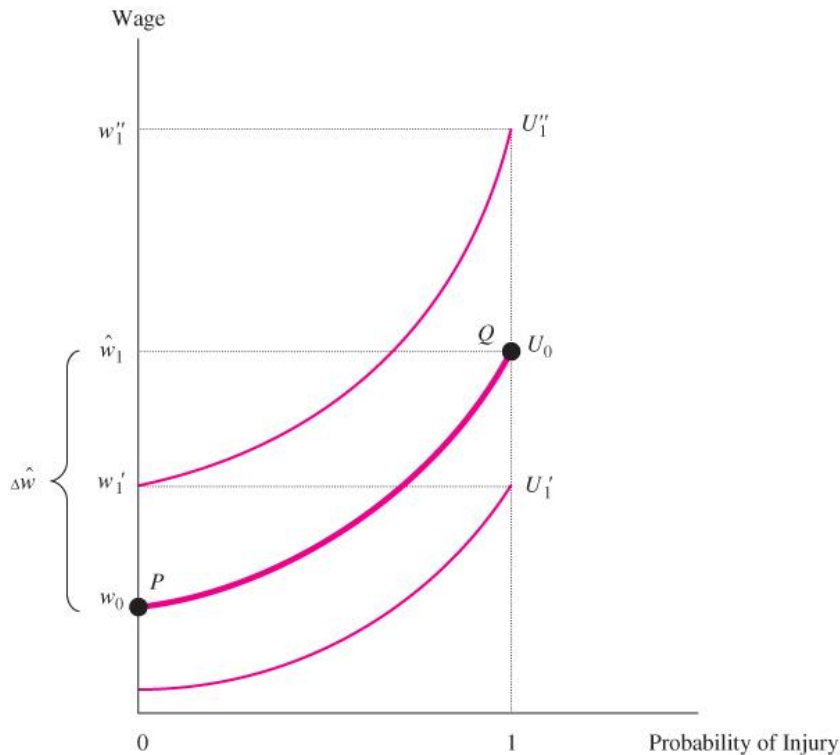
- ▶ Note: $w_A < w_B^N$
- ▶ The difference in the wage offers, $w_B^N - w_A$, is the compensating differential for the difference in non-pecuniary characteristics, $Z_A - Z_B$.



Example: Risky vs. Safe jobs

2 types of jobs:

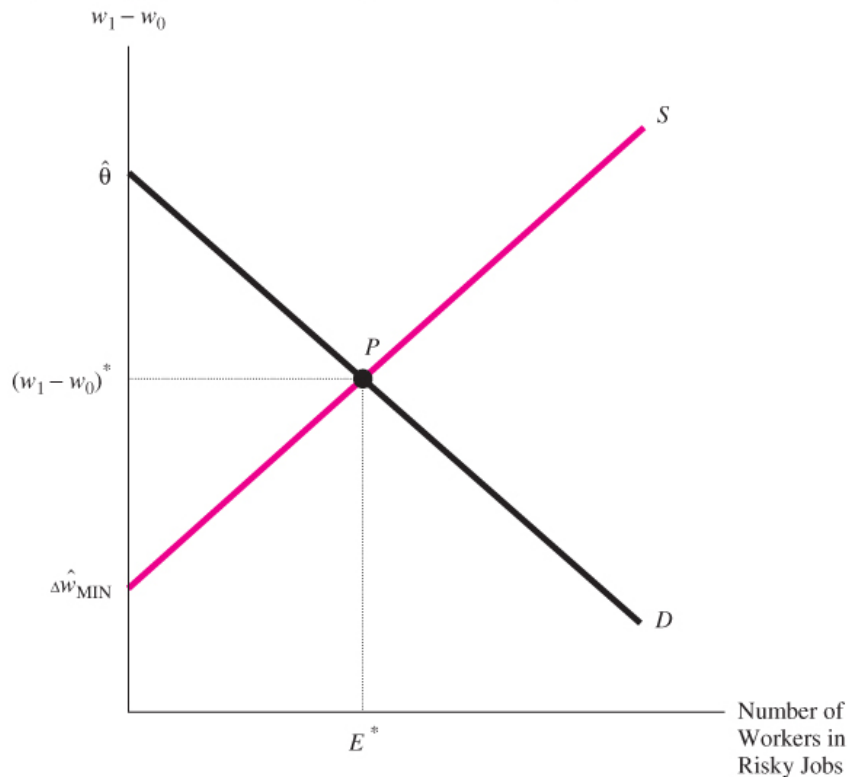
- ▶ Safe ($\rho = 0$)
- ▶ Risky ($\rho = 1$)
- ▶ Information is complete.



$$U = f(w, \rho)$$

- ▶ $\partial U / \partial w > 0$
- ▶ $\partial U / \partial \rho < 0$

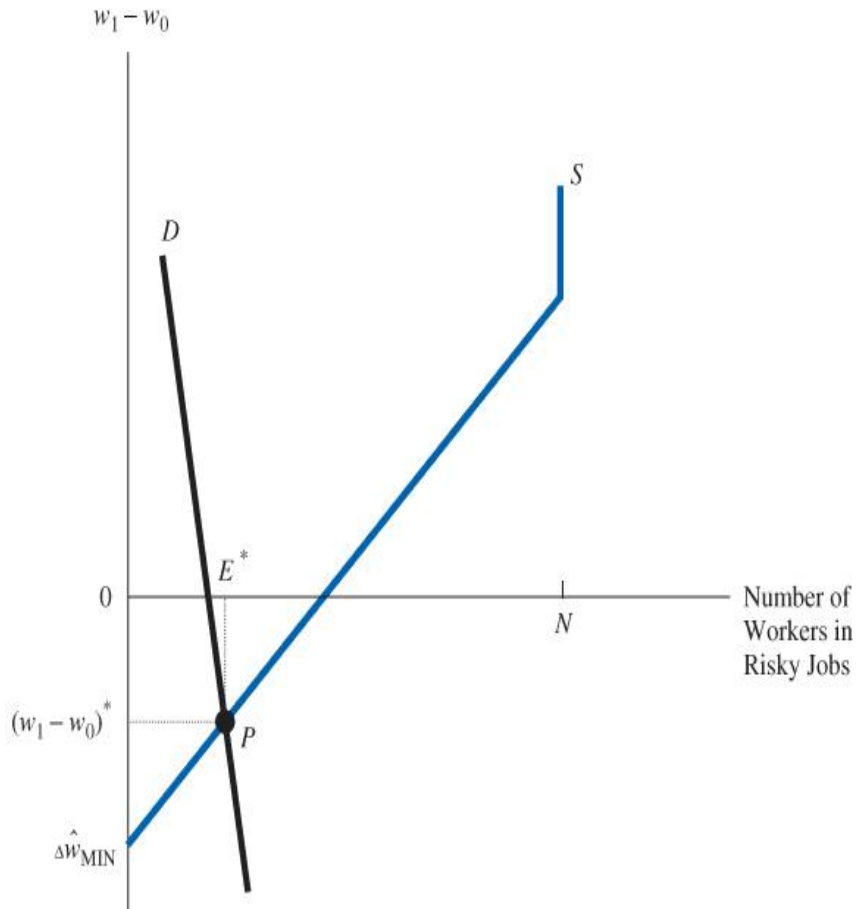
Example: Risky vs. Safe jobs



- ▶ If firms have to pay to workers more than they need to make the environment safe, they will hire only for safe-jobs.



Risky jobs & Weird preferences

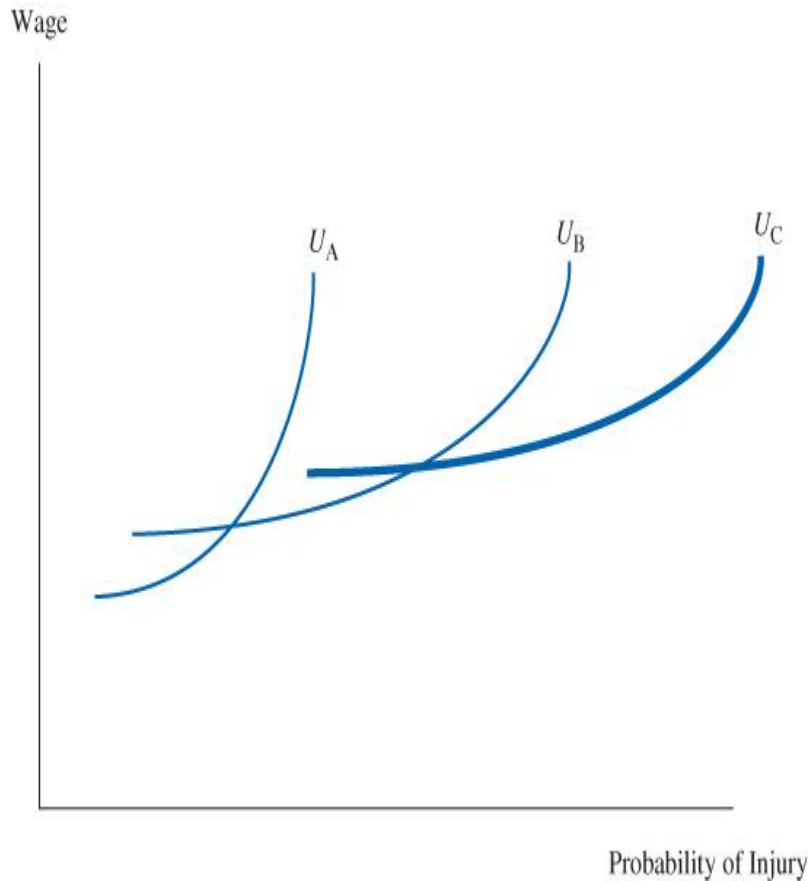


- ▶ When the demand for the risky job is high (the labor supply to risky job) compared to the supply of it (demand for the labor), the price goes up (the wage goes down).

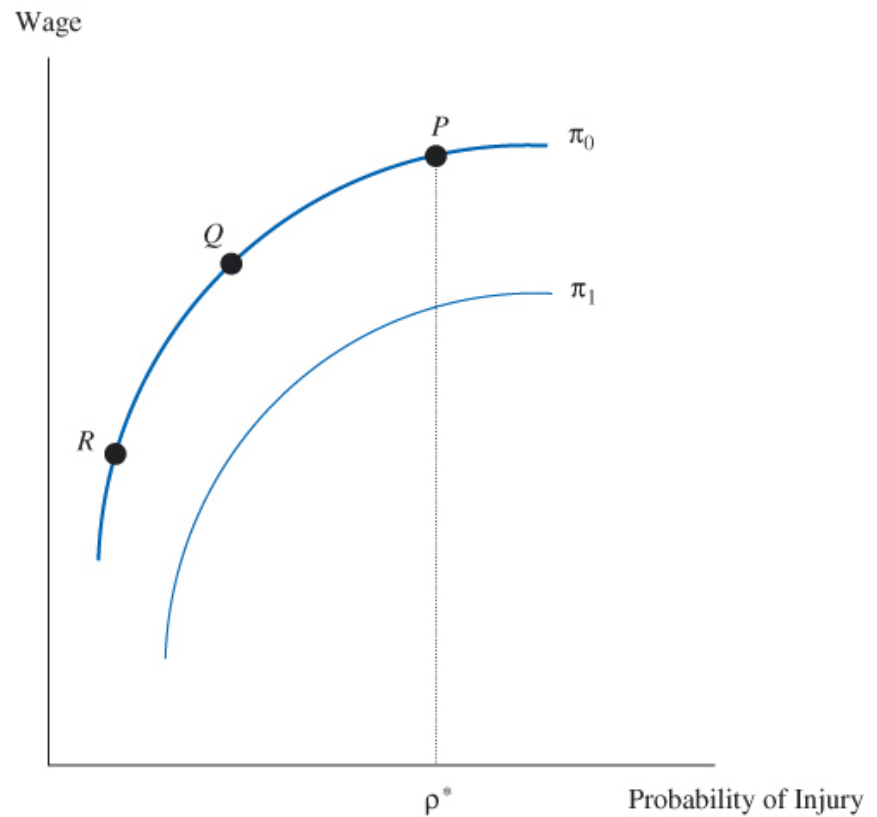
- ▶ e.g. Space Tourists

Heterogeneity in the market

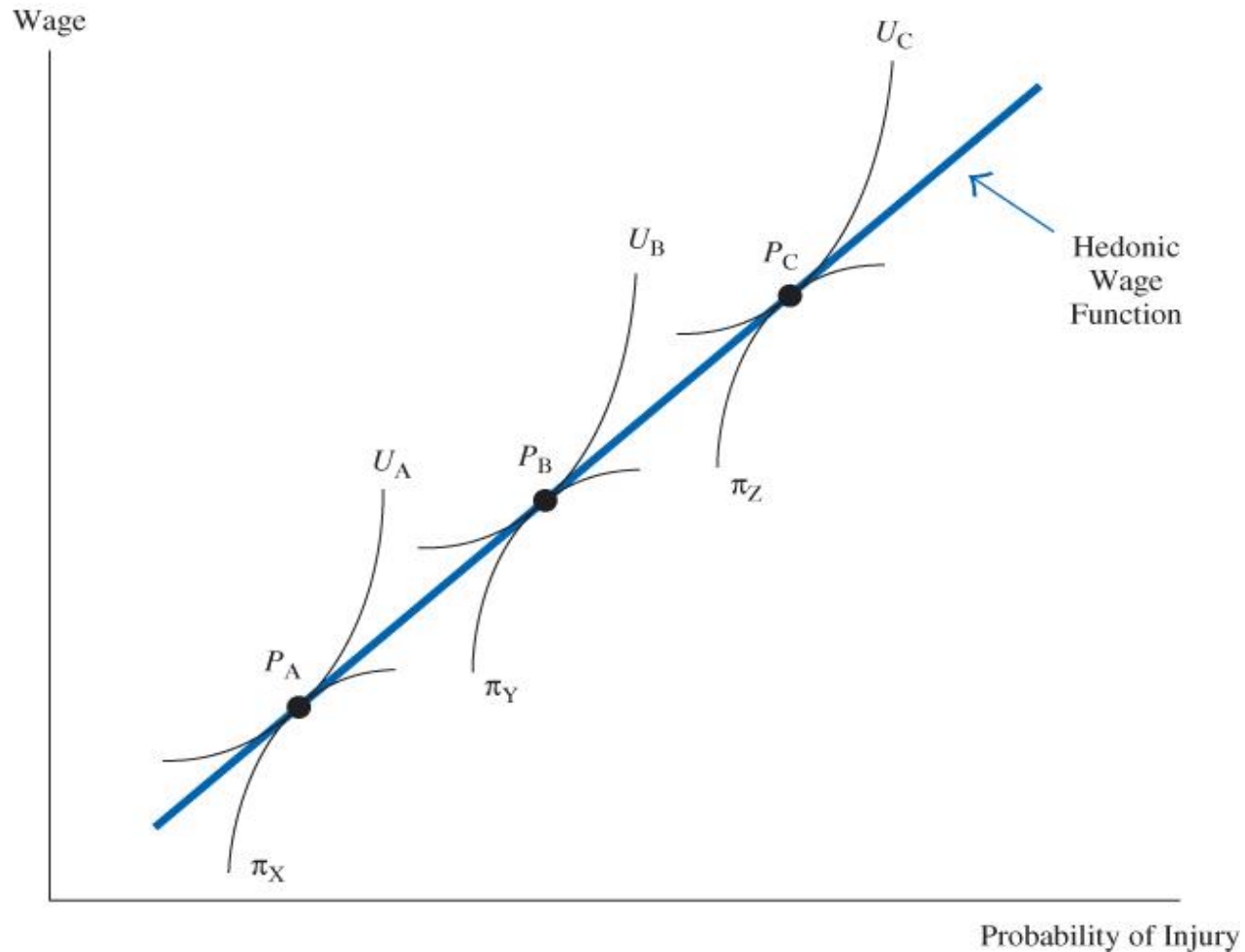
Risk preference



Isoprofit curves



Equilibrium with Heterogeneity



Taking risky jobs: Applications

- ▶ The value of human life
- ▶ Based on the observation on how much more people want to be paid to take a slightly more risky job it is possible to evaluate the *value of statistical life*

- ▶ $(\rho_{new} - \rho_{old})(w_{new} - w_{old})$

- ▶ Speed limits
- ▶ Saved hours
- ▶ Lost lives

- ▶ Statistically

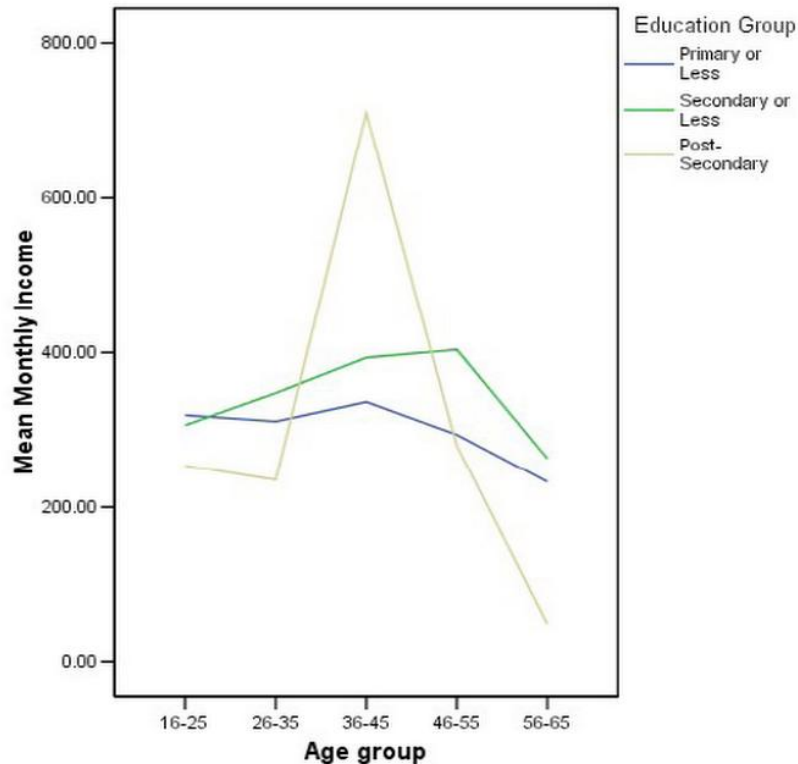
$$\begin{aligned} 1 \text{ life} &= 125\text{k hours} \\ &= 15 \text{ years} \end{aligned}$$





Human Capital

Facts about education, experience, earnings



- ▶ More educated people earn more.
- ▶ Earnings rise, then fall
- ▶ Earnings of more educated people show more growth and peak later in life.

Source: 2000 Ethiopian Urban Household Survey. Incomes shown for people who reported an income on a monthly basis of between 10 and 1000 Birr and worked at least 25 hours per week. People with no schooling and religious schooling excluded.

The Concept of Human Capital

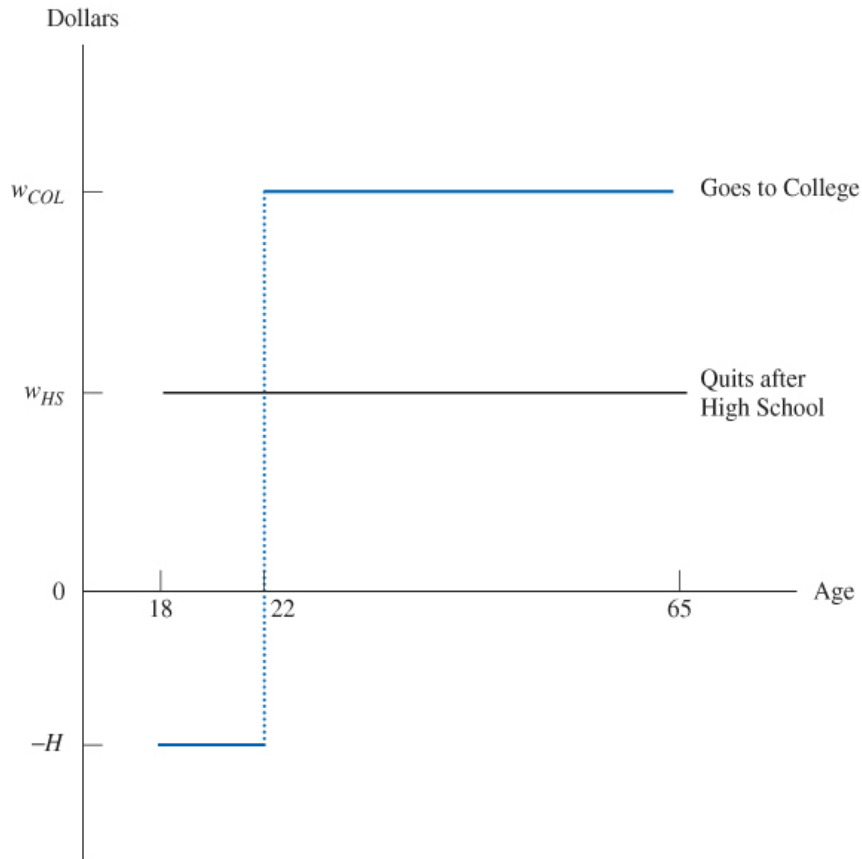
Human Capital is the abilities and skills of any individual, esp those acquired through investment in education and training, that enhance potential income earning.

Sources of HC:

- ▶ formal schooling,
- ▶ on-the-job training,
- ▶ experience,
- ▶ abilities the individuals are born with.



Going to college



▶ Future income compared to

▶ Cost of Education

▶ Opportunity cost

▶ Discounting the future!



Present Value (review)

- ▶ Suppose a person can put her money into a risk free investment that pays r *per year per 1 CZK* invested.

Thus, it will be

- ▶ $(1 + r)$ CZK in one year;
- ▶ $(1 + r)^2$ CZK in two years;
- ▶ etc.

Present Value calculations can be used to calculate *future value of money*.



Foregone earnings and college attendance

- ▶ Working after school:

$$\begin{aligned} PV_{HS} &= w_{HS} + \delta w_{HS} + \delta^2 w_{HS} + \dots + \delta^{T-1} w_{HS} \\ &= \sum_{t=1:T} \delta^{t-1} w_{HS} \end{aligned}$$

- ▶ Working after college:

$$\begin{aligned} PV_C &= 0 + \delta 0 + \delta^2 0 + \delta^3 0 + \delta^4 w_C + \delta^5 w_C + \dots + \delta^{T-1} w_C \\ &= \sum_{t=1:4} \delta^t 0 + \sum_{t=5:T} \delta^{t-1} w_C \end{aligned}$$

$$PV_C > PV_{HS}$$



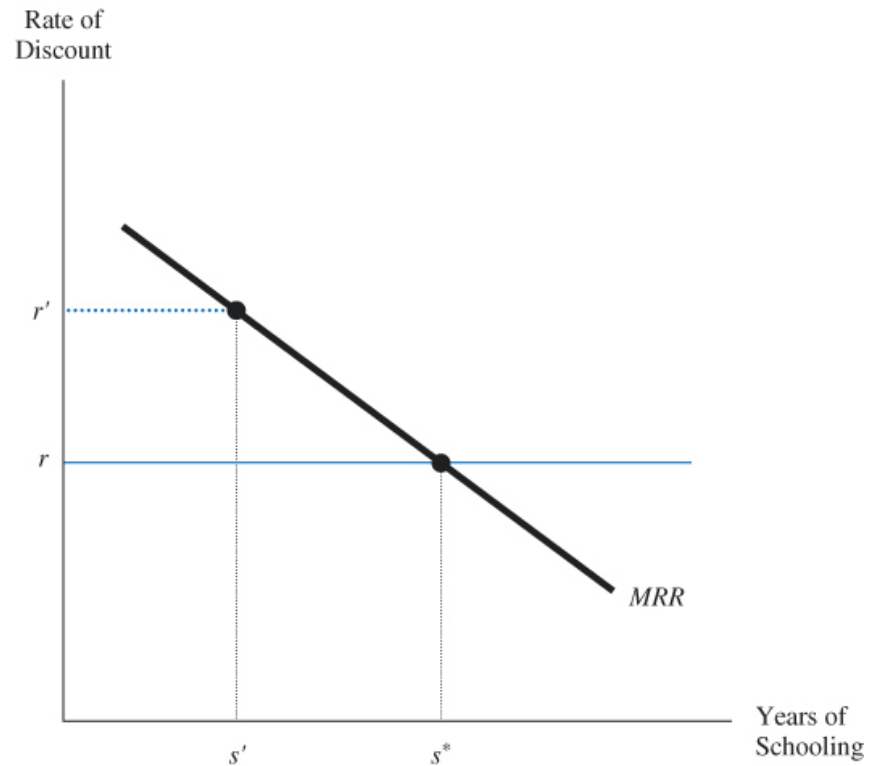
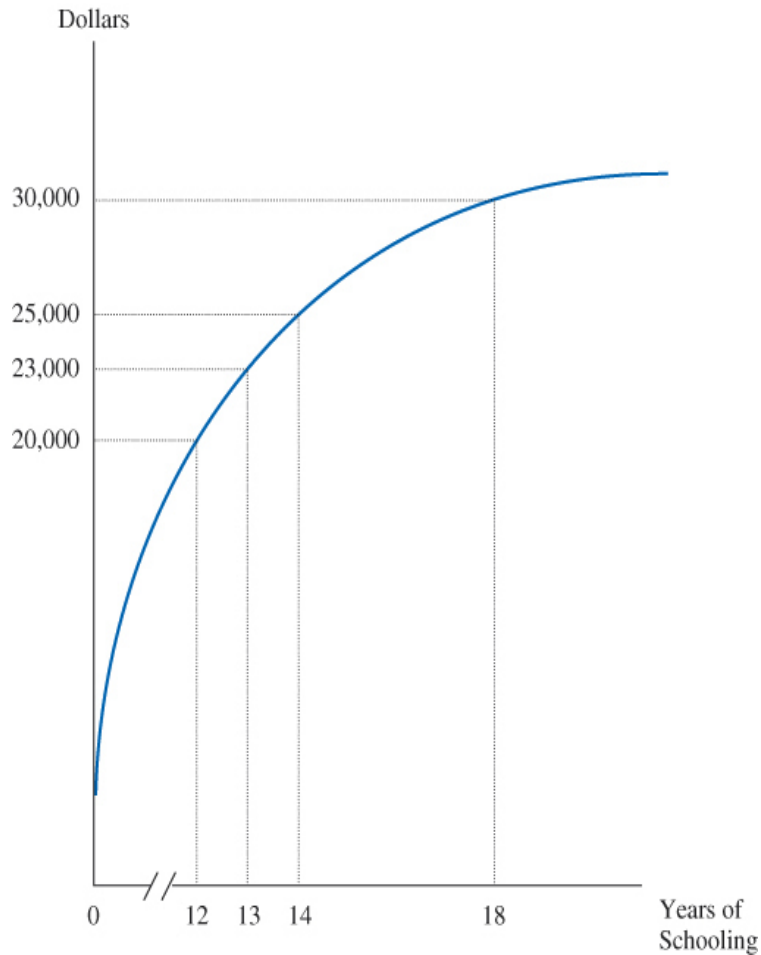
Direct cost of schooling (e.g. tuition)

Tuition $D > 0$

$$\begin{aligned} NPV_C &= -D - \delta D - \delta^2 D - \delta^3 D + \delta^4 w_C + \delta^5 w_C + \dots + \delta^{T-1} w_C \\ &= -\sum_{t=1:4} \delta^{t-1} D + \sum_{t=5:T} \delta^{t-1} w_C \end{aligned}$$

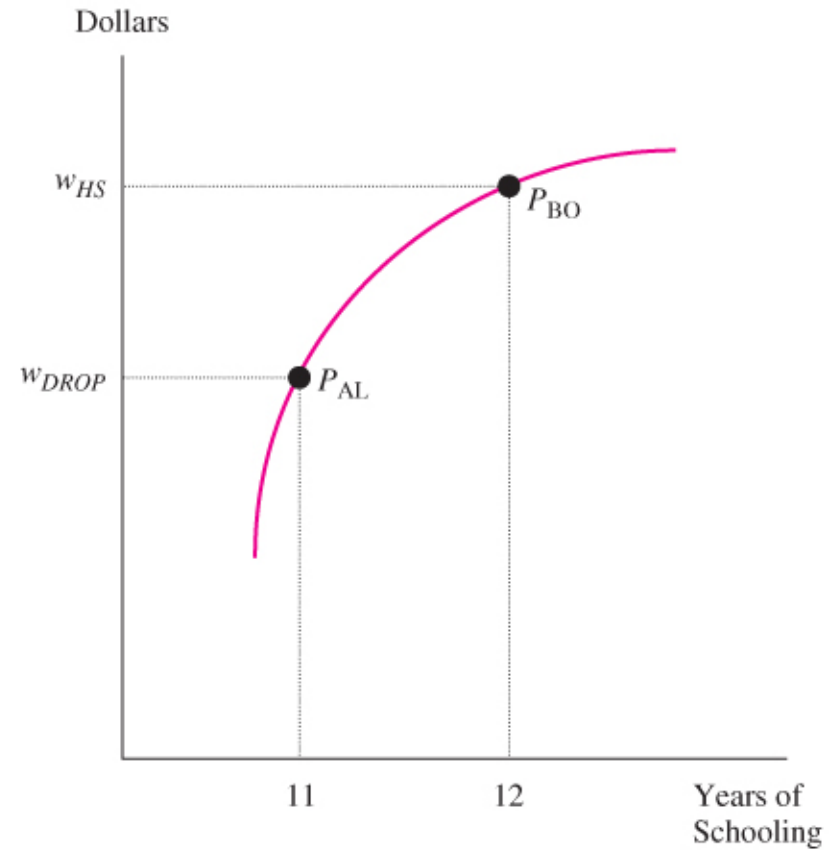
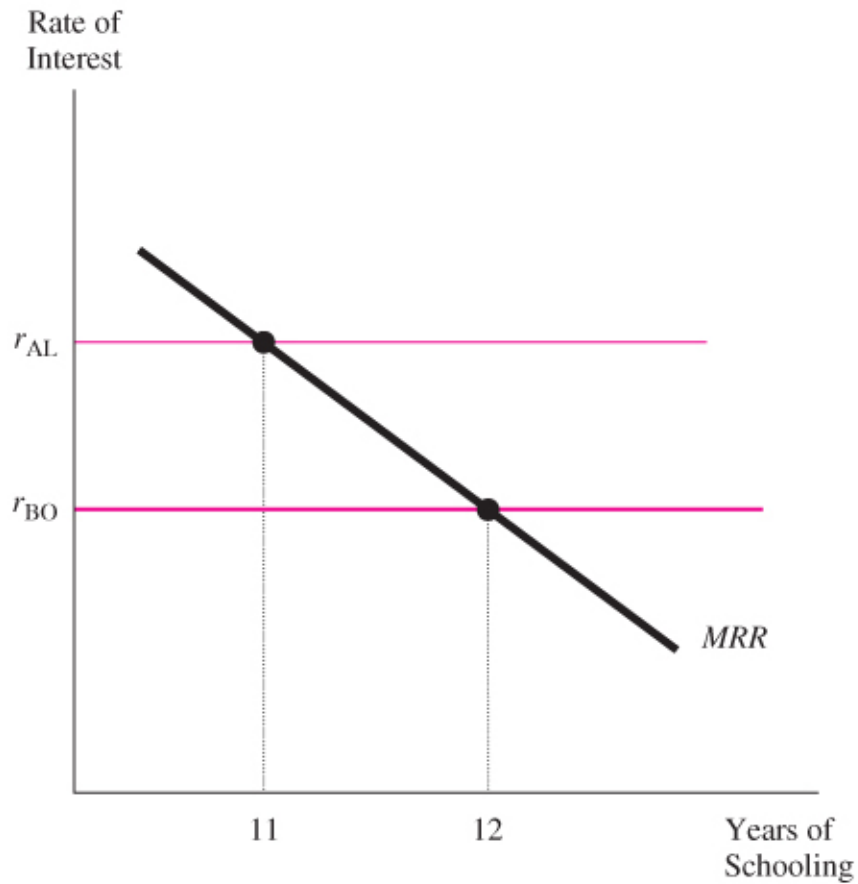


Years of education

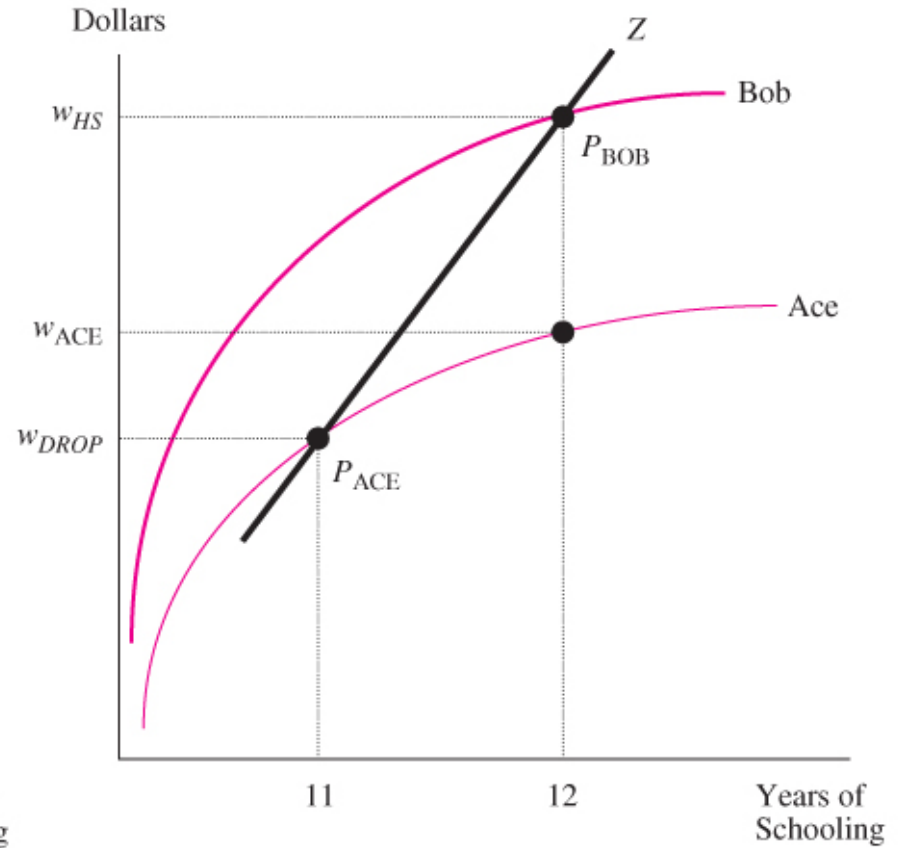
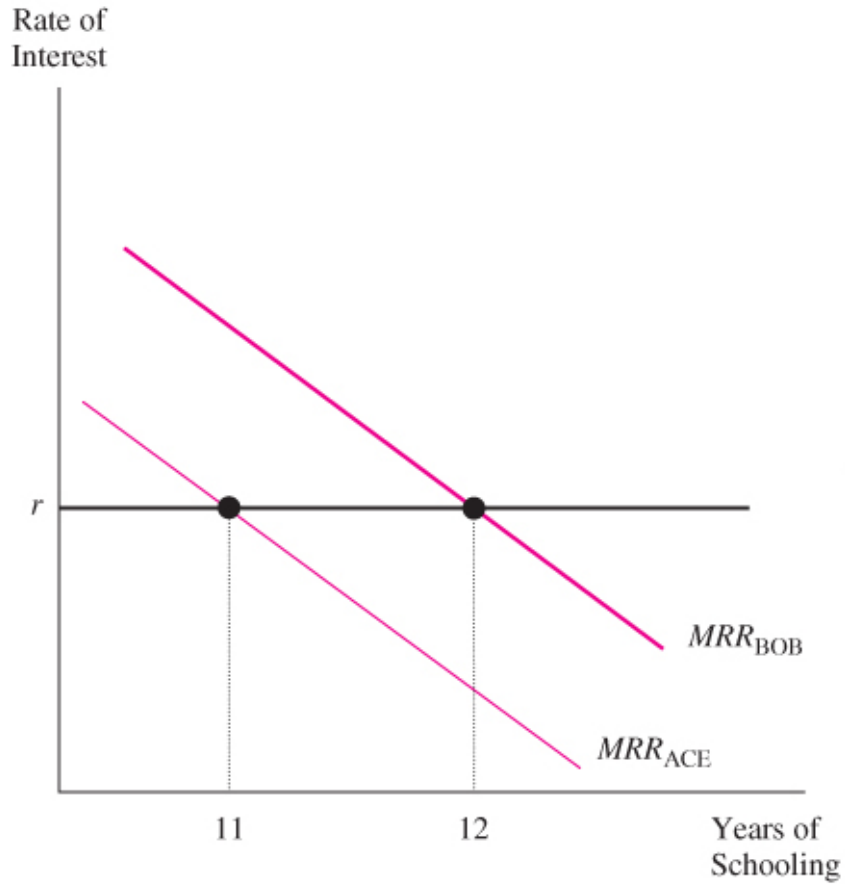


Marginal rate of return is the percentage change in earnings resulting from extra year of school

Different discount rates: Myopia



Different Abilities



Why Does Schooling Vary?

- ▶ Discount rates are different
- ▶ Different abilities
- ▶ Credit constraints
- ▶ Returns to college are uncertain

- ▶ Age



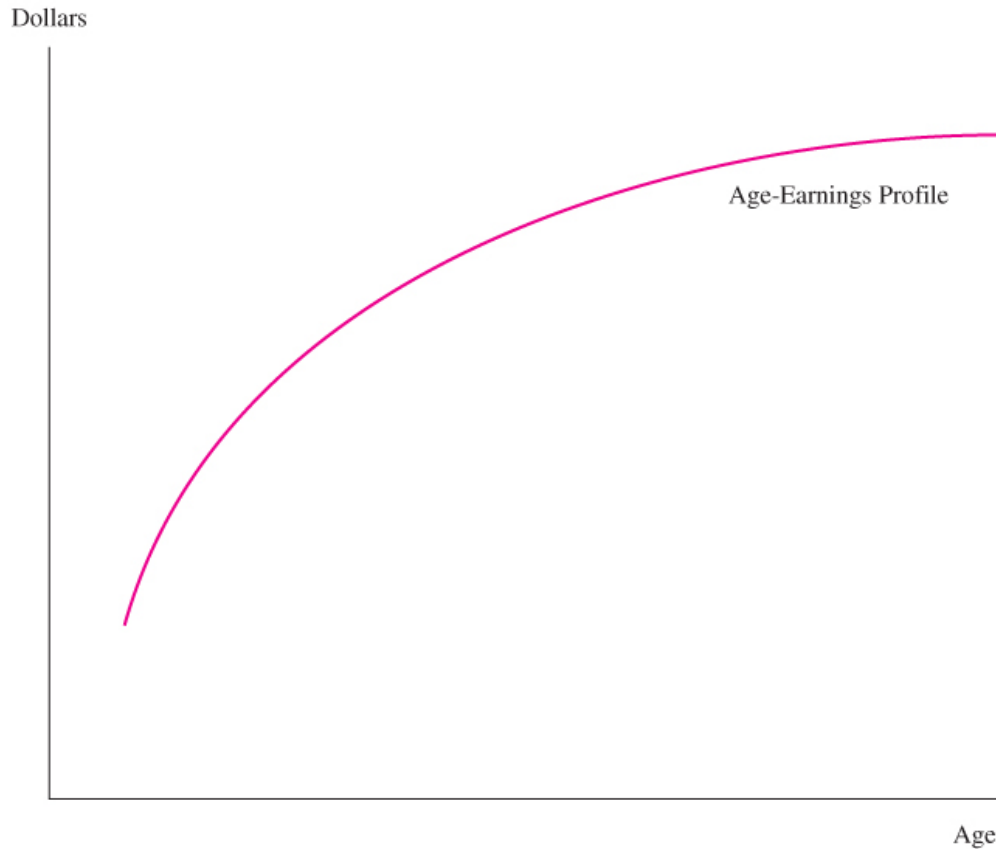
Life Cycle and HC Investment

Why people invest to HC throughout their life cycle?

- ▶ HC depreciates
- ▶ Returns to HC change over time
- ▶ People update their preferences



The age-earnings profile implied by HC theory



- ▶ Upward-sloping and concave



On-the-job training

Types:

- ▶ General HC
- ▶ Firm-specific HC

Will firms provide general training to their workers?

