

# ECONOMICS OF EDUCATION





NEW

SZÉCHENYI PLAN

# ECONOMICS OF EDUCATION

Sponsored by a Grant TÁMOP-4.1.2-08/2/A/KMR-2009-0041

Course Material Developed by Department of Economics,

Faculty of Social Sciences, Eötvös Loránd University Budapest (ELTE)

Department of Economics, Eötvös Loránd University Budapest

Institute of Economics, Hungarian Academy of Sciences

Balassi Kiadó, Budapest



The project is supported  
by the European Union.

National Development Agency  
[www.ujszechenyiterv.gov.hu](http://www.ujszechenyiterv.gov.hu)  
**06 40 638 638**



**HUNGARY'S RENEWAL**



The projects have been supported  
by the European Union.

ELTE Faculty of Social Sciences, Department of Economics

---

# ECONOMICS OF EDUCATION

Author: Júlia Varga

Supervised by Júlia Varga

June 2011

# ECONOMICS OF EDUCATION

## Week 1

The economic value of education

Human capital model

Júlia Varga

# Human capital in the early economic thought

”The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labour, and which, though it costs a certain expense, repays the expense with a profit.”

*Adam Smith, 1776 The Wealth of Nations*

# Human capital in the early economic thought

”There is no doubt about the answer to the very controversial question of whether the immaterial goods (services) of mankind form a part of national wealth or not. Since the more highly schooled nation, equipped with the same material goods, creates a much larger income than an uneducated people, and since this higher schooling can only be obtained through an educational process which requires a larger consumption of material goods, the more educated nation also possesses a larger capital, the returns of which are expressed in the larger product of its labor.”

*Von Thünen 1875*

# Theorizing human capital formation

- Theodor W. Schultz : *The Economic Value of Education*, 1963.
- Gary S. Becker: *Human Capital*, 1964.
- Jacob Mincer: *Schooling, Experience, and Earnings*, 1962



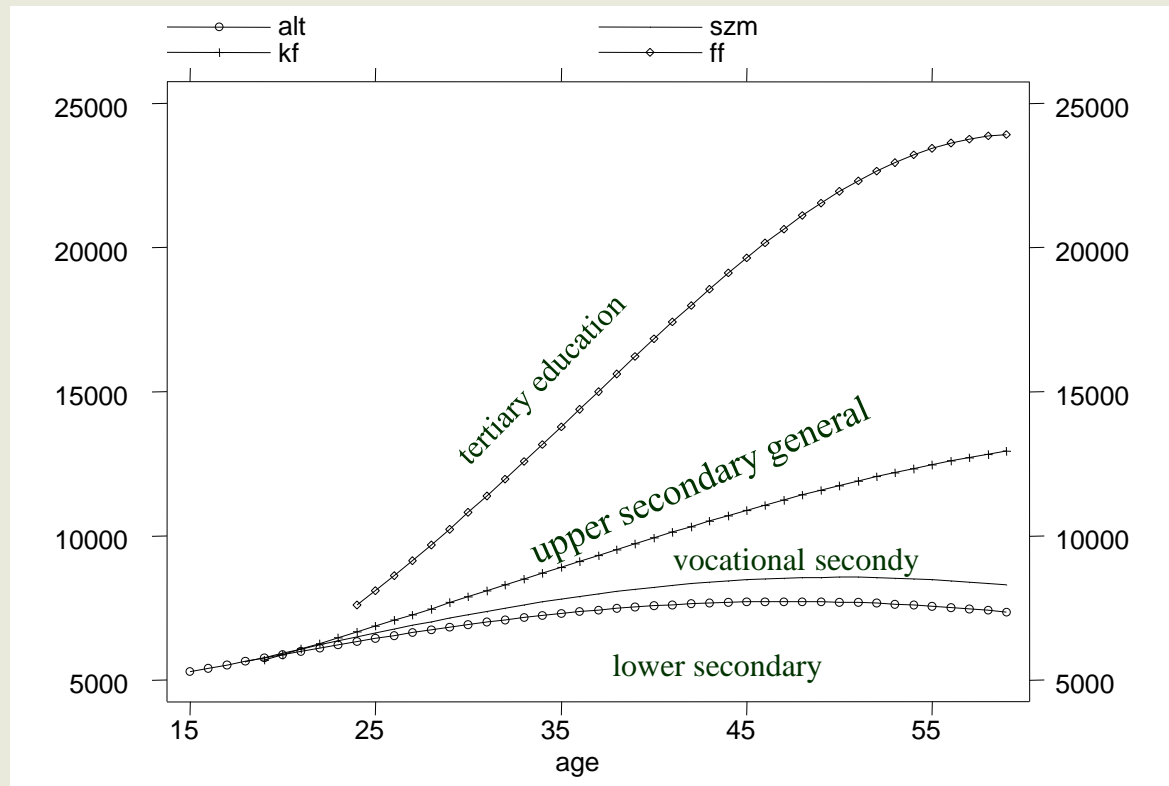
# Human capital

Human capital is individual's productive skills, talents and knowledge.

Education and training raise the productivity of workers by imparting useful knowledge and skills.

Education involve currents costs but future returns.

# Age-earnings profiles

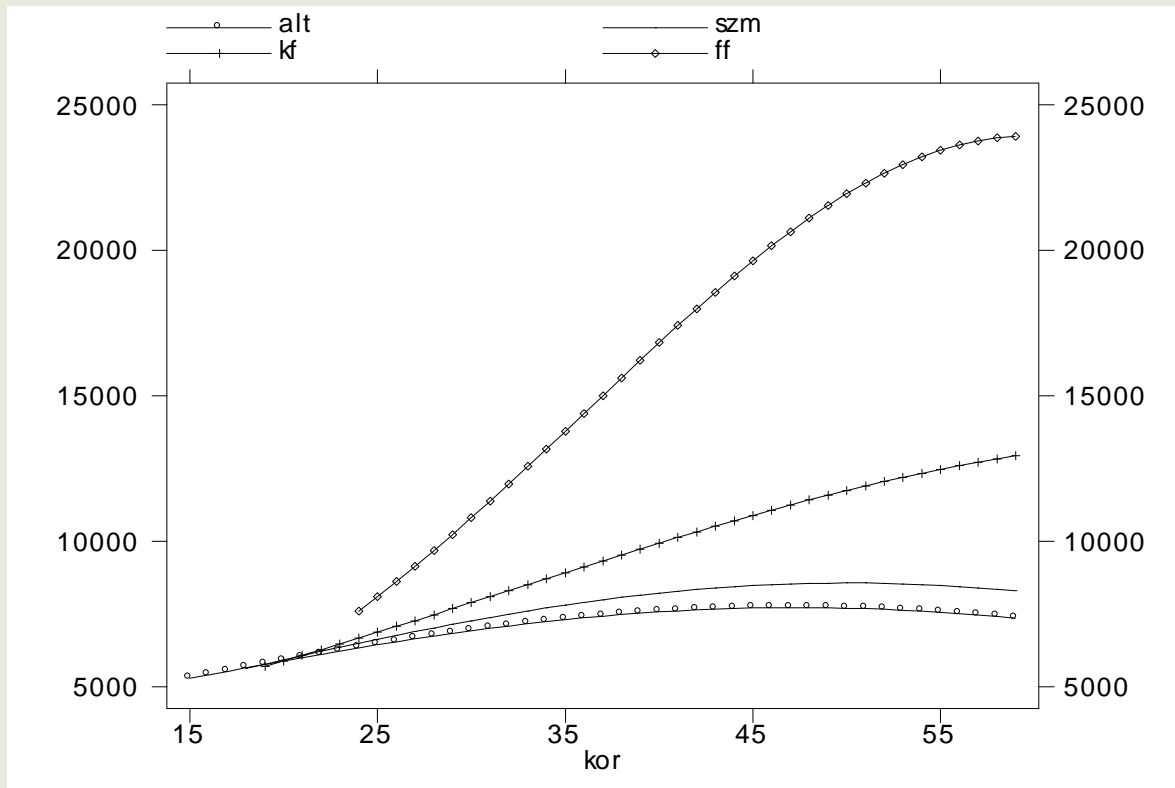


Hungary, 1989, private sector

Source: Based on data of Hungarian Wage-tariff Survey

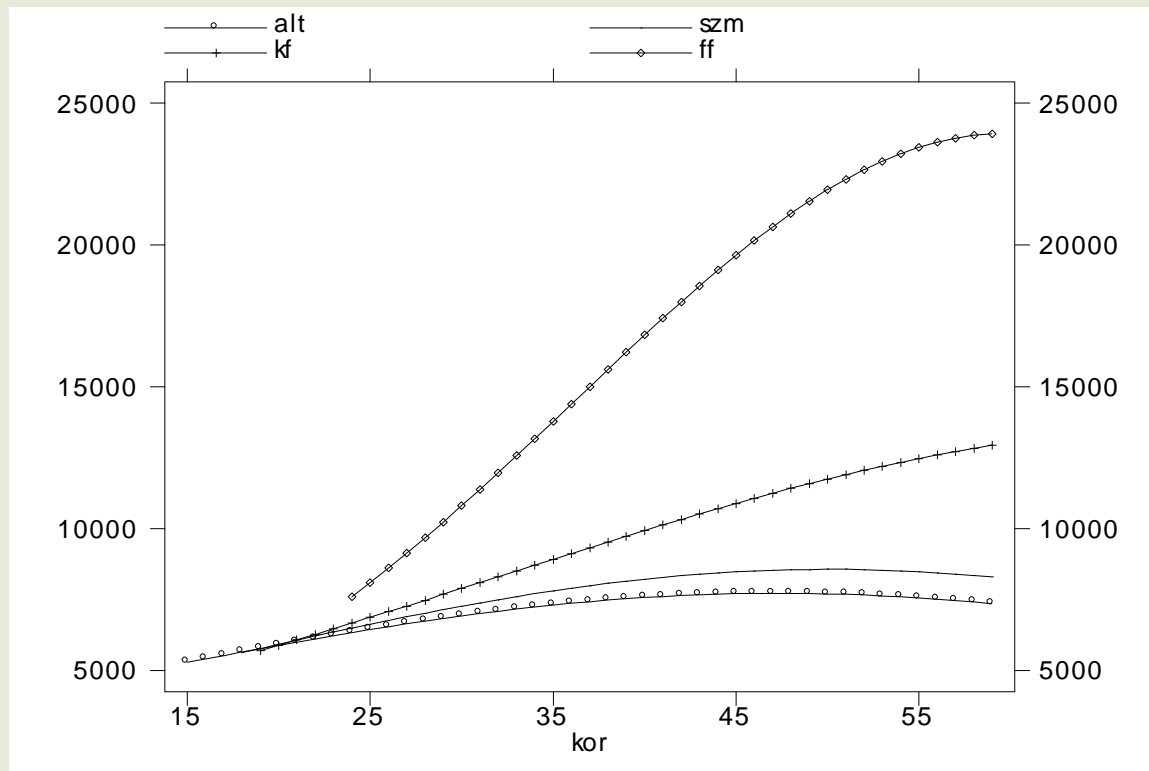
# Main characteristics of stylized age-earnings profiles

1. The absolute level of earnings at any point in time is higher for people with a higher level of schooling.



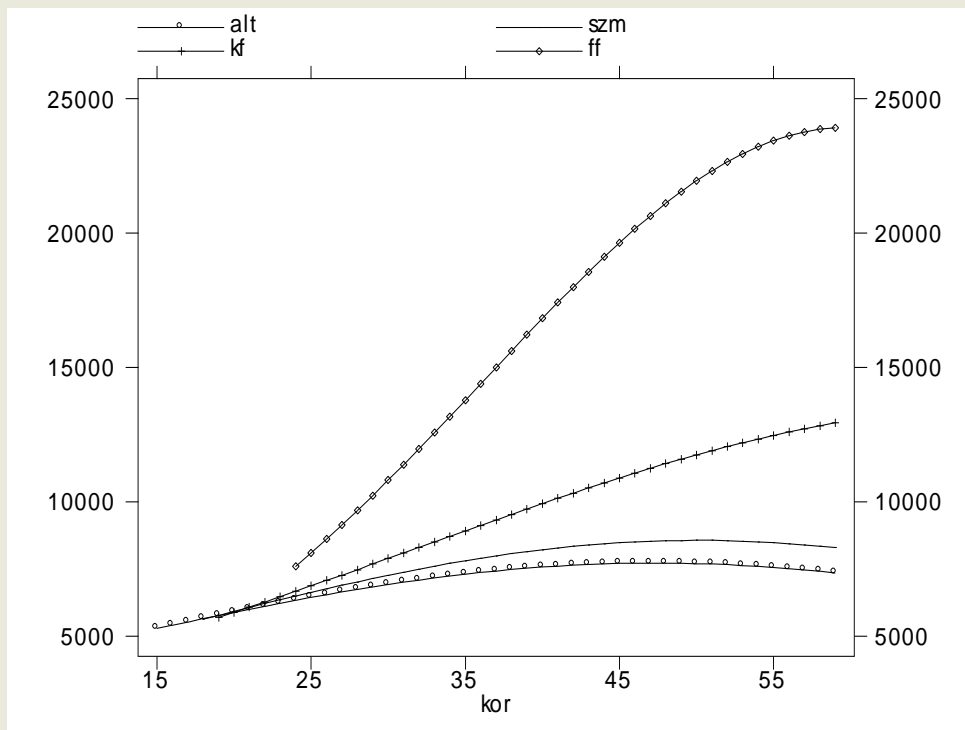
# Main characteristics of stylized age-earnings profiles

- Age-earnings profiles are concave in age. That is, earnings increase with age at a decreasing rate, up to a maximum and then flatten or even decline.



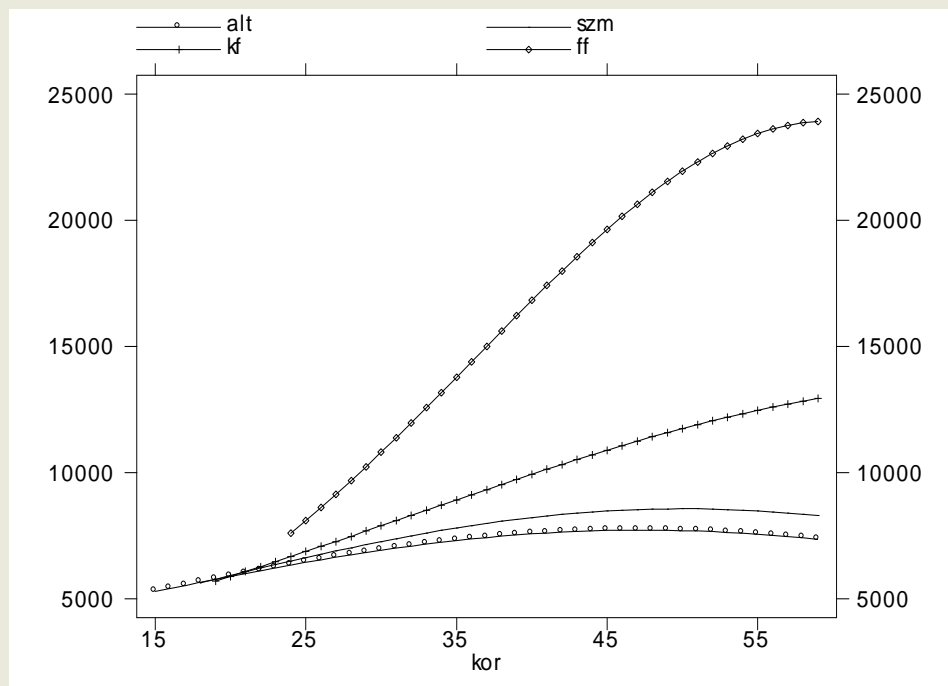
# Main characteristics of stylized age-earnings profiles

3. The slope of the profile is positively correlated with level of schooling. The maximum level of earnings tend to be reached at a later age for people with a higher level of education.



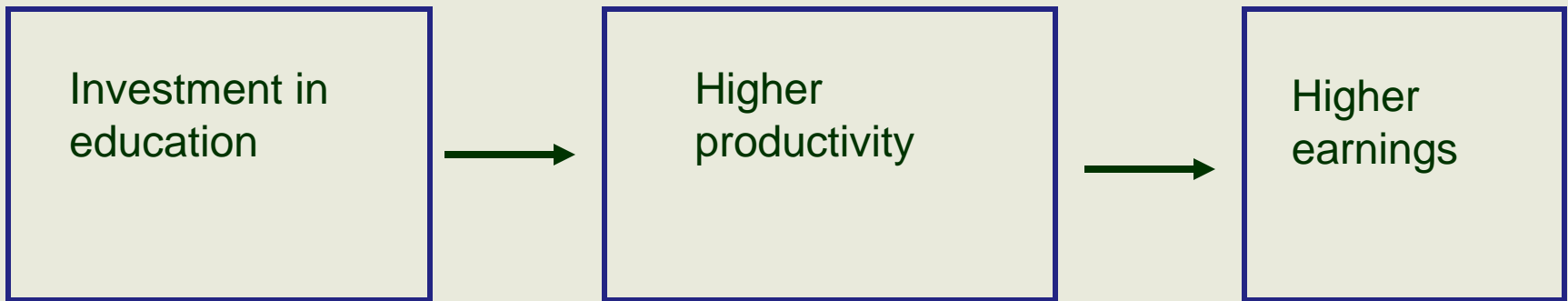
# Main characteristics of stylized age-earnings profiles

4. The earnings differentials for differently educated people tend to increase with the level of education, that is at any given age, the differential earnings associated with a given differential in years of schooling increases with the absolute level of schooling.



# Human capital theory

$MP=W$



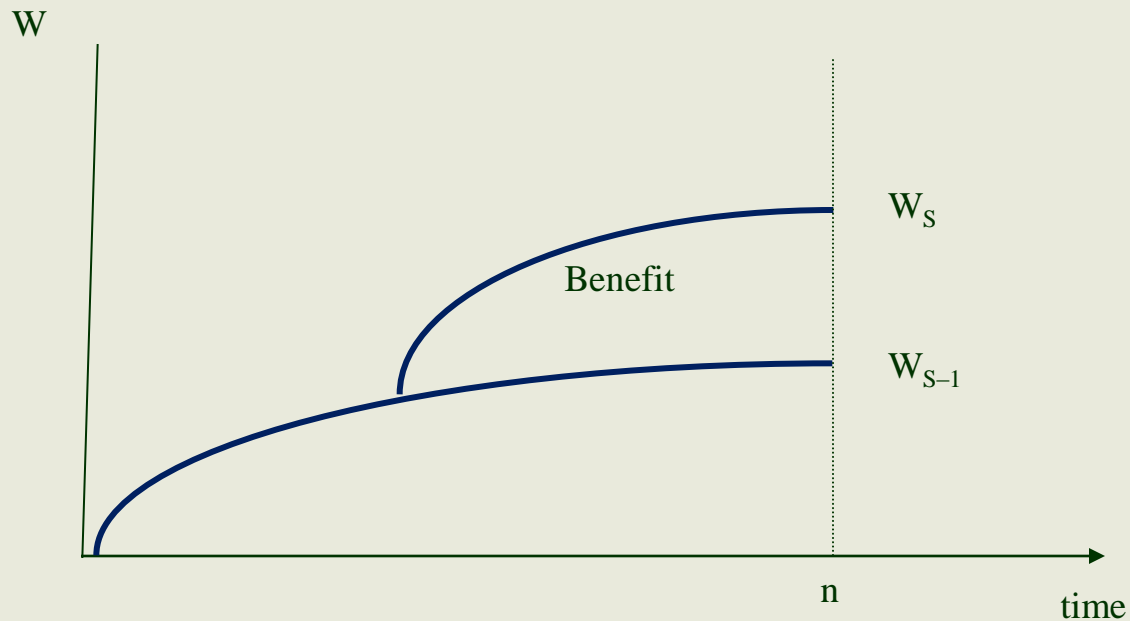
# Human capital model – base model

- $MP=W$
- the individual is a benefit maximizer
- the individual is well informed
- he/she pay the costs of education



# Human capital model – base model

## Benefit = lifetime income gain



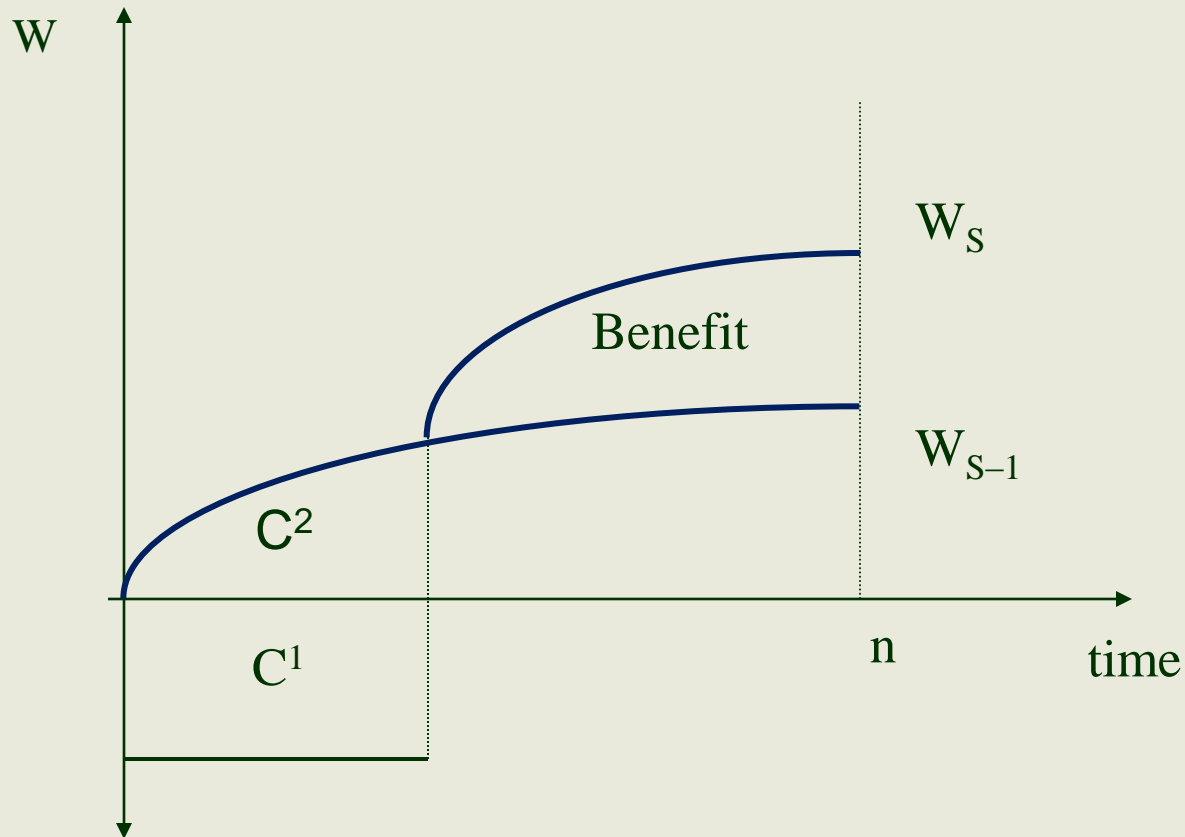
# Human capital model – base model

## Costs

1. Direct costs (tuition fee, cost of books and supplies, other out of pocket costs etc.)  $C^1$ .
2. Indirect costs: earnings foregone  $C^2 = W_{s-1}$ .

# Human capital model – base model

## Costs and benefits



# Present value of benefit

$$\sum_{t=1}^n \frac{(W_s - W_{s-1})_t}{(1+i)^t}$$

- Present income is more valuable than future income

(it may be invested and earn additional income).

- Incomes in future periods must be discounted.

# Present value of costs

$$\sum_{t=1}^n \frac{(W_{s-1} + C^1)_t}{(1+i)^t}$$

# Education investment decision

$$\text{Max. NCV} = \sum_{t=1}^n \frac{(W_s - W_{s-1})_t}{(1+i)^t} - \sum_{t=1}^n \frac{(W_{s-1} + C^1)_t}{(1+i)^t}$$

# The interest (discount) rate

Market interest rate or rate of time preference?

Rate of time preference: the rate at which the individual is willing to swap present consumption goods for future consumption goods.

# Discount rate

1. Rate of time preference  $<$  market rate of interest

The individual values present goods less highly than the market

$i$  = market rate of interest

(it is the real opportunity cost since the individual can always earn at least that rate of interest)

2. Rate of time preference  $>$  market rate of interest

The individual values present goods more highly than the market

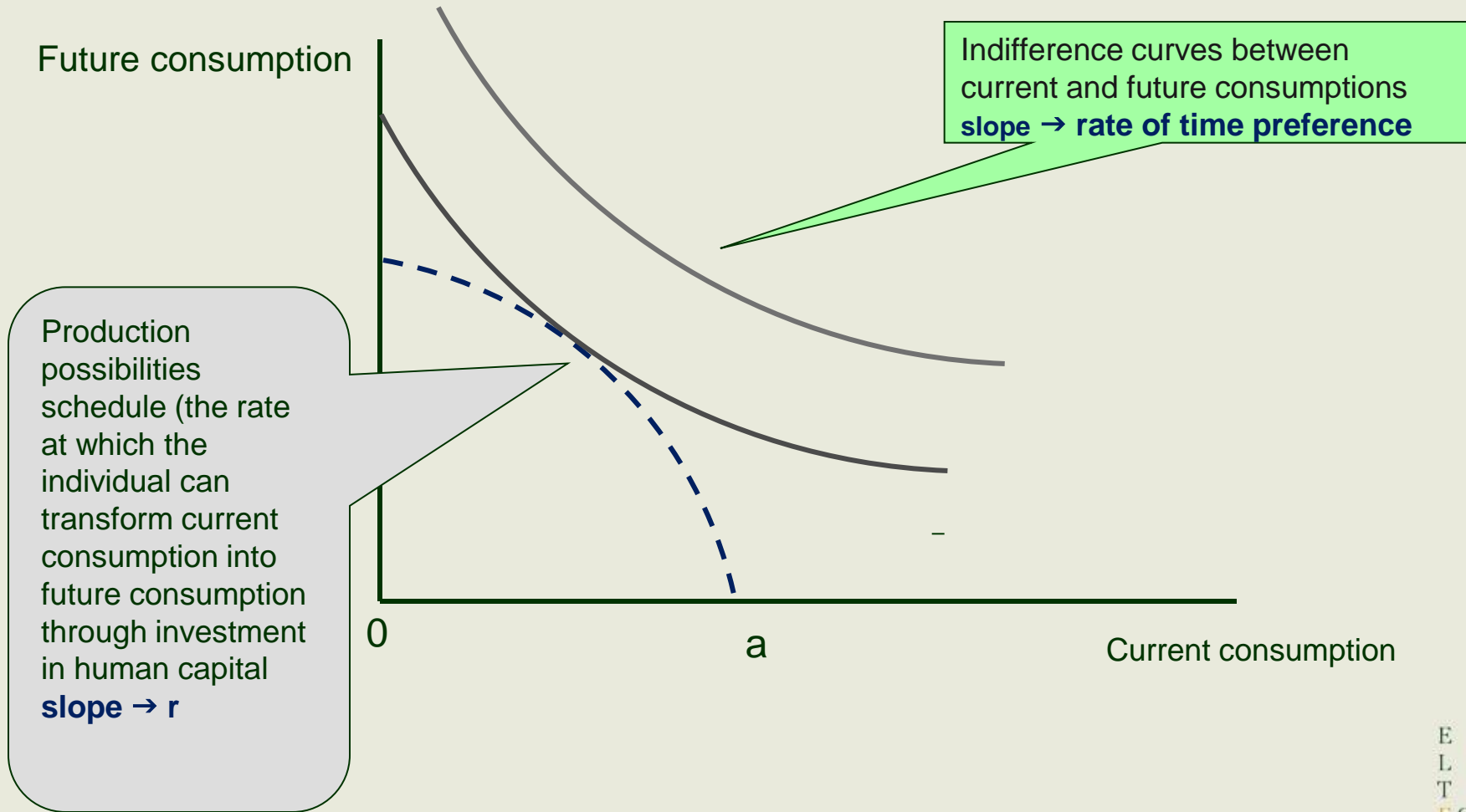
$i$  = rate of time preference



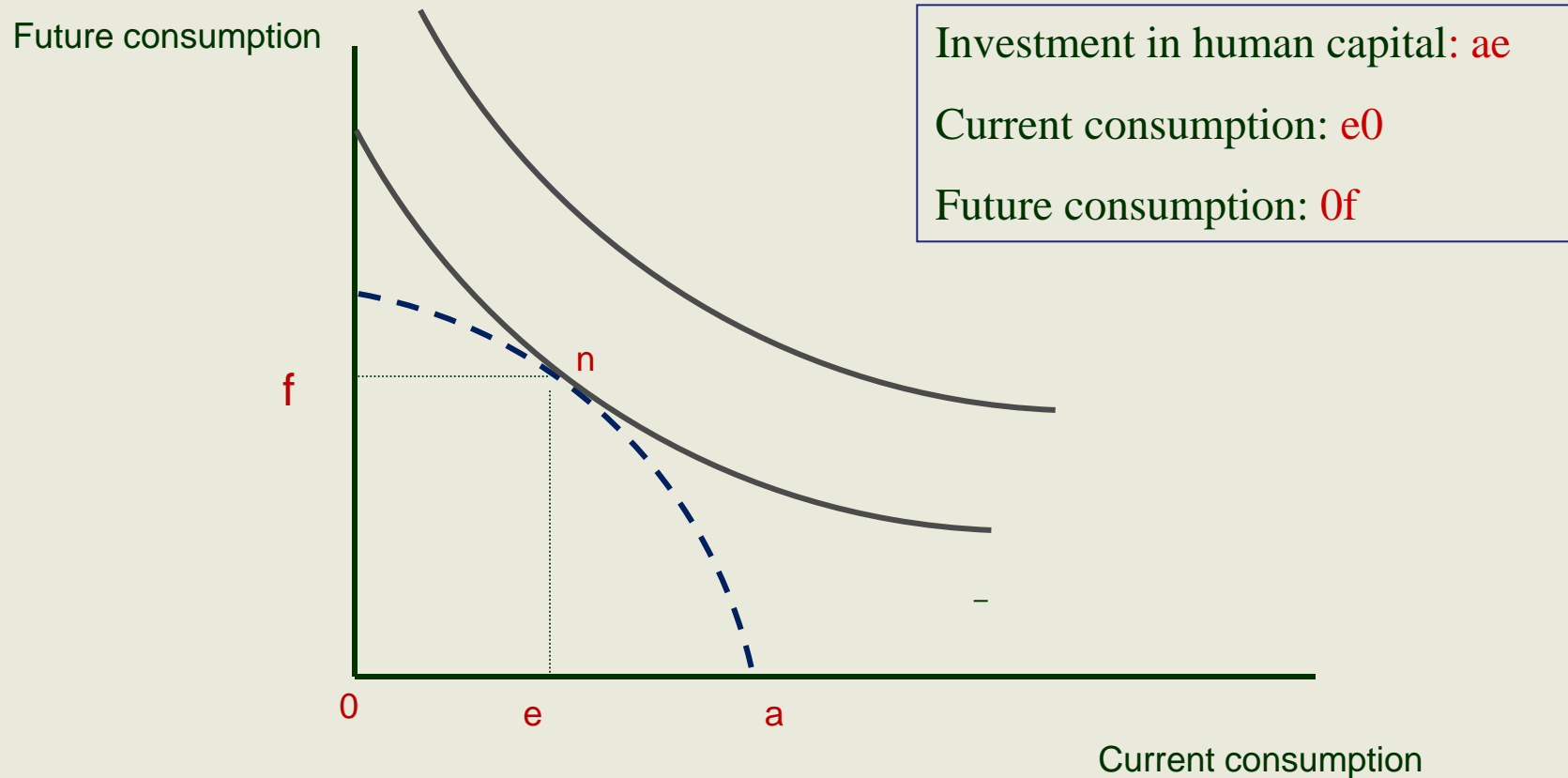
# Internal rate of return = $r$

$$\sum_{t=1}^n \frac{(W_s - W_{s-1})_t}{(1+r)^t} = \sum_{t=1}^n \frac{(W_{s-1} + C^1)_t}{(1+r)^t}$$

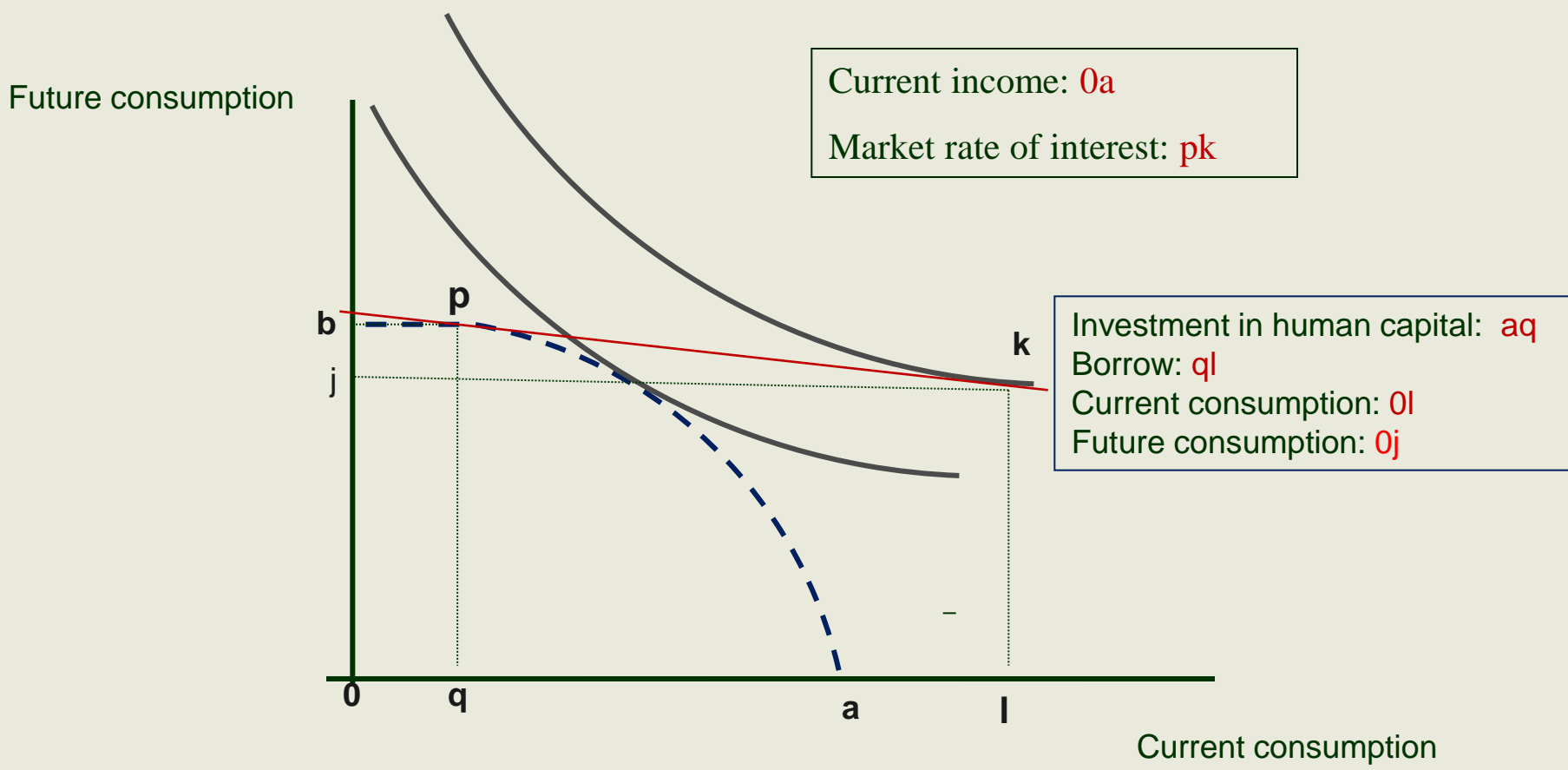
# Individual investment decisions (no loans for human capital investment)



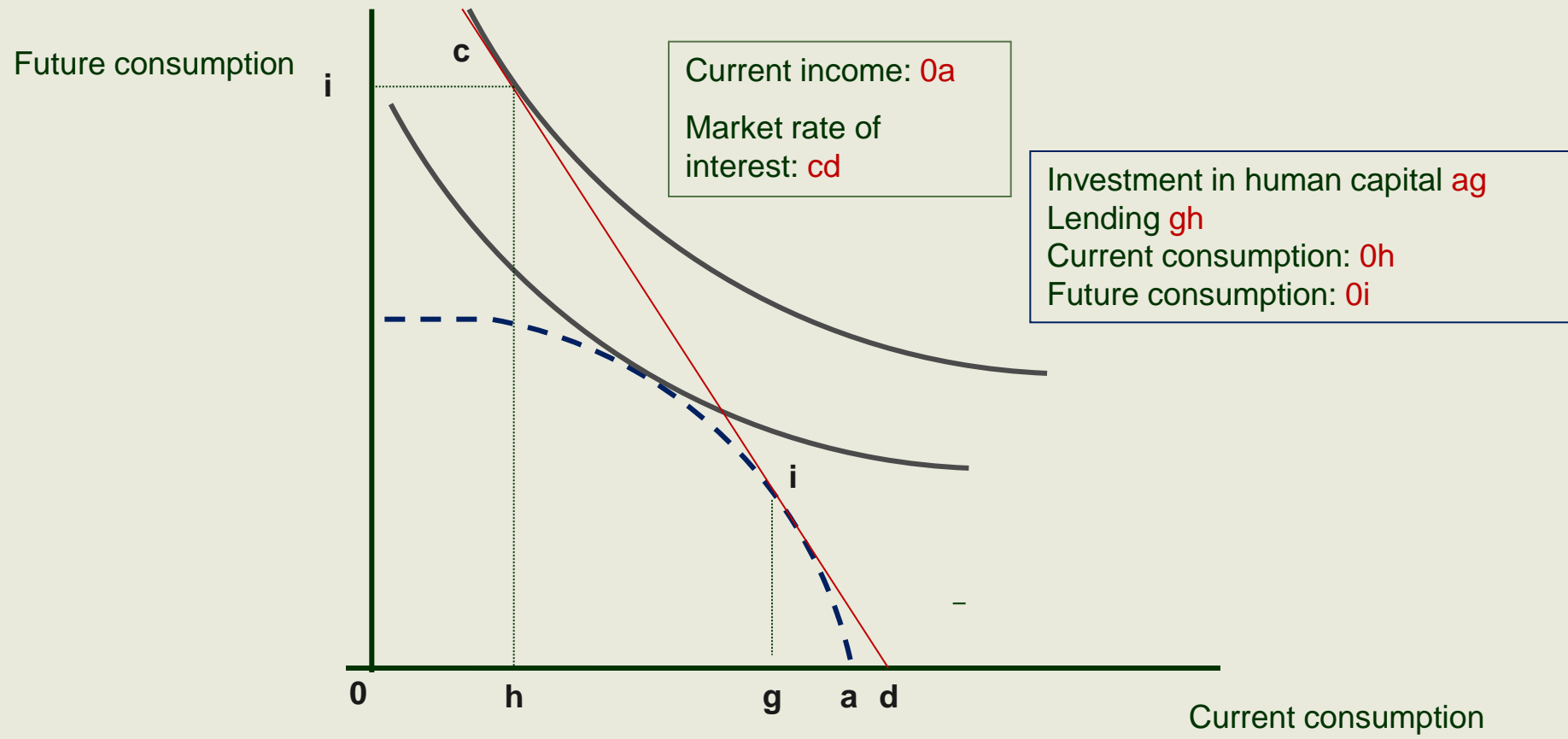
# Individual investment decisions (no loans for human capital investment)



# Individual investment decision with borrowing/lending possibility



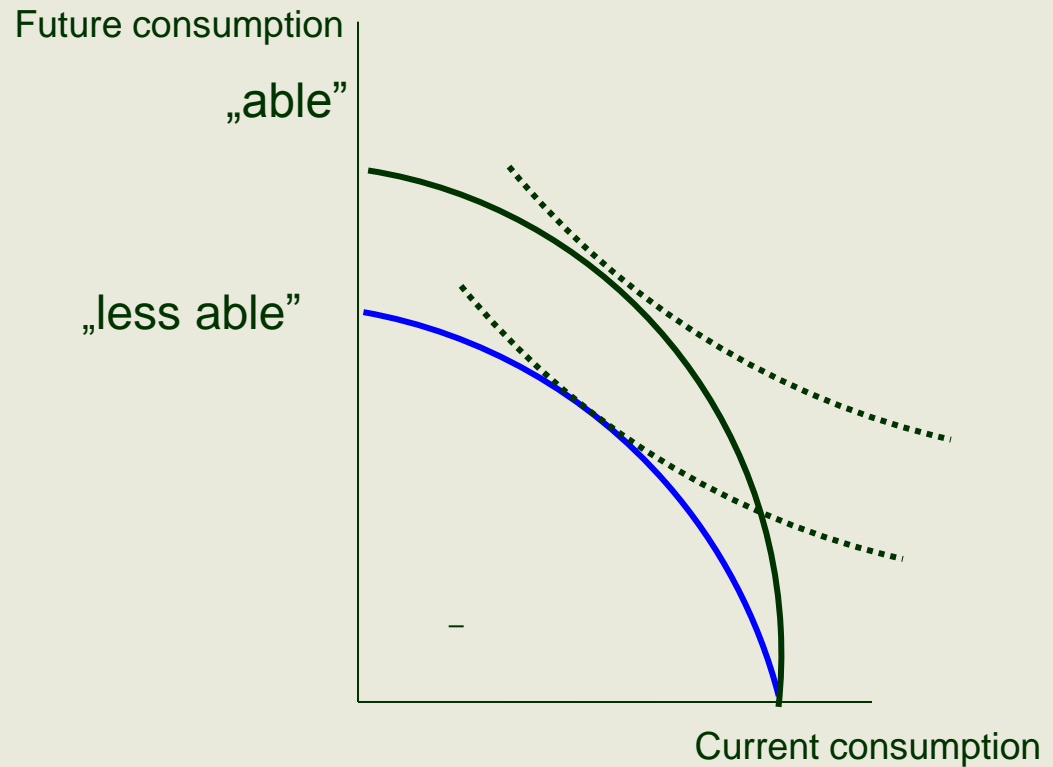
# Individual investment decision with borrowing/lending possibility



# Why do people learn for different time?

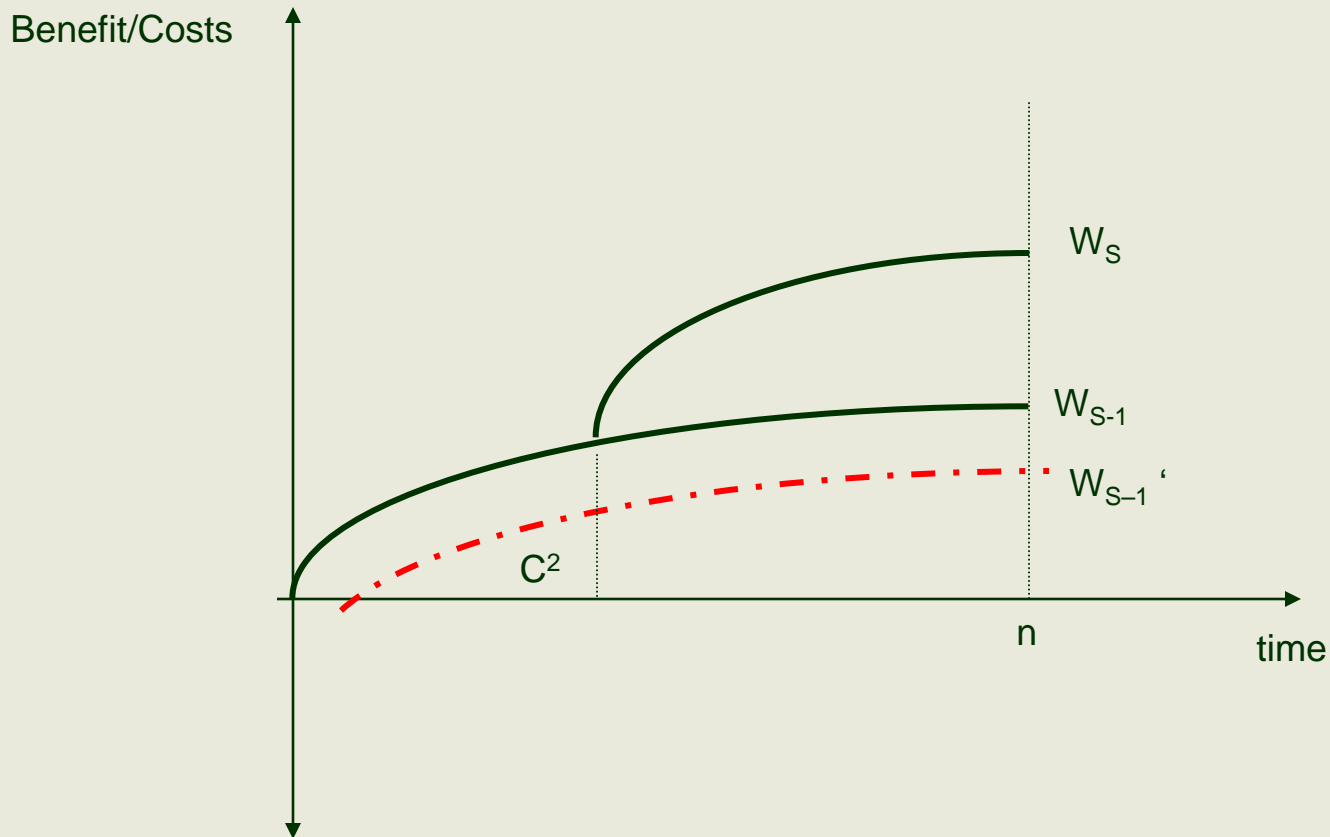
1. Benefits are different for different people.
2. Costs are different for different people  
(earnings foregone, direct costs, expected time in which the yield of the human capital investment can be collected).
3. Rate of time preference is different for different people → different discount rates.

# Benefits are different



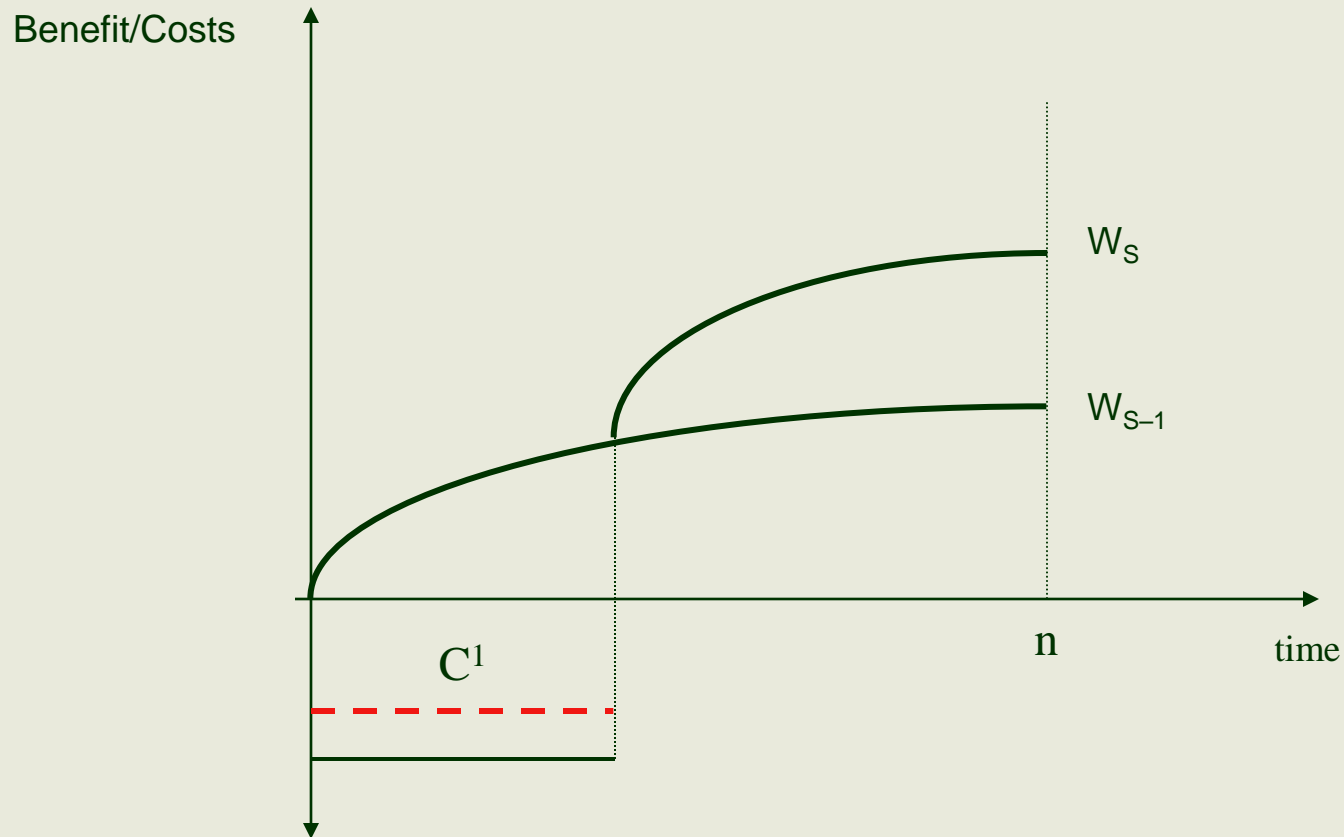
Abilities are different

# Costs are different – different earnings foregone

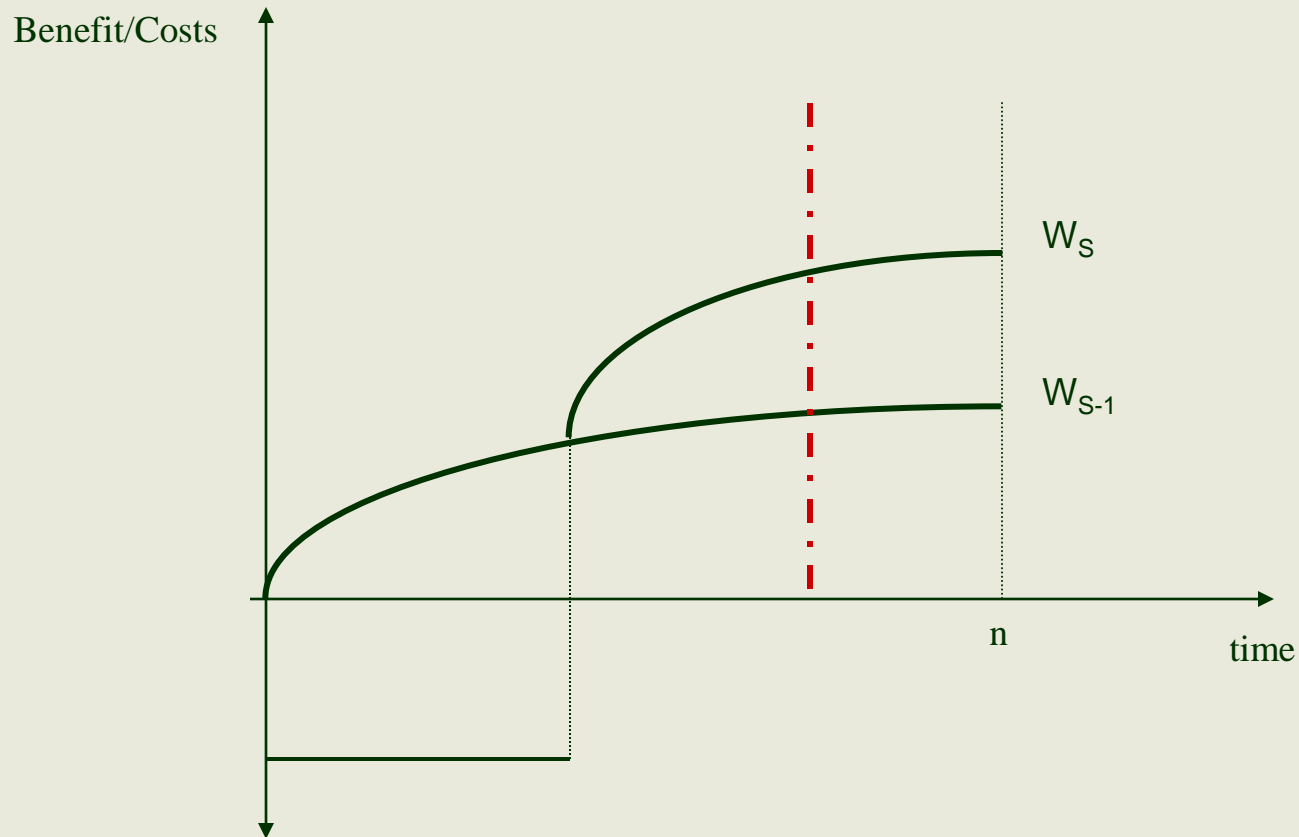




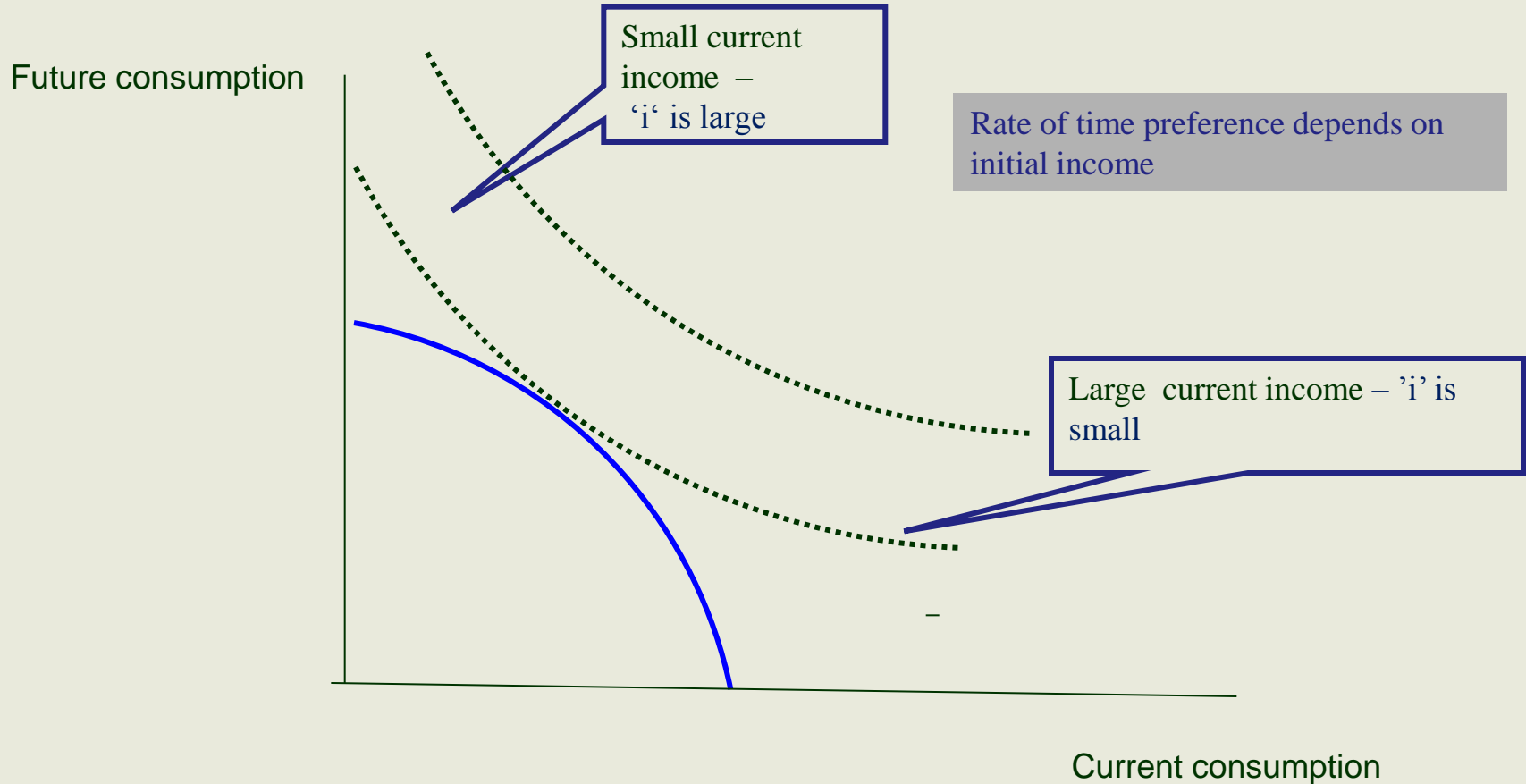
# Costs are different – different direct costs



# Costs are different – different life spans



# Rate of time preference is different



# Peculiarities of human capital

Human capital is an illiquid asset (cannot be separated from its owner)

- cannot be sold or gifted away,
- the life span of human capital depends on the life span of its owner,
- the individual's own time is required for acquiring human capital.

High risk and uncertainty

Risk – the probability distribution of chances is known.

Uncertainty – the probability distribution of chances is not known.

# Peculiarities of human capital

Human capital is an illiquid asset.

May not be held as collateral against risk and uncertainty – financial institutions are less likely to lend for investment in human capital.

# Risk and uncertainty

$$\sum_{t=1}^n \frac{[\sum_{j=1}^m P_j (W_s - W_{s-1})_j]_t}{(1+i+u)^t} = \sum_{t=1}^n \frac{[\sum_{k=1}^s P_k (W_{s-1} + C^1)_k]_t}{(1+i+u')^t}$$