

# The Economics of European Regions: Theory, Empirics, and Policy

Dipartimento di Economia e Management

Co-funded by the  
Erasmus+ Programme  
of the European Union



Project funded by  
European Commission Erasmus + Programme –Jean Monnet Action  
Project number 553280-EPP-1-2015-1-IT-EPP/JO-MODULE

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November 13, 2017

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# A brief summary

Summarizing:

- Human capital is a potential important source of growth and inequality across European regions
- It is difficult to calculate directly
- A Solow model augmented with human capital shows how the accumulation of human capital can be crucial for the overall dynamics

# Compensations and human capital

Compensations of workers could be taken as a possible **proxy** of human capital.

Four main approaches to the determination of compensations:

- The theory of subsistence wage (Malthus) and of natural level of wages (Ricardo)
- Real wages are equal to the **marginal productivity of labour** (marginalistic revolution)
- Theory of efficiency wages (Stiglitz and Weiss)
- Real wages are the result of **bargaining between unions and firms** in an economy with imperfectly competitive markets (both the factor and good markets).

However, in every approach marginal productivity of labour is a reference point for the level of wages.

If real wages are equal to marginal productivity of labour then

$$\frac{W}{P} = \frac{\partial Y}{\partial L} = \frac{\partial Y}{\partial H} \frac{\partial H}{\partial L} = \frac{\partial Y}{\partial H} h \quad (1)$$

taking Cobb-Douglas technology then:

$$\frac{W}{P} = (1 - \alpha) Ah \left( \frac{k}{h} \right)^\alpha \quad (2)$$

Therefore real wage depends on

- level of technological progress
- level of human capital
- level of the ration between physical and human capital
- technological parameter  $\alpha$

⇒ there is not a direct relationship between real wages and the stock of human capital.

Figura: Compensations per employee  
in 1991

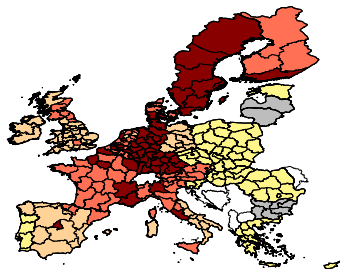
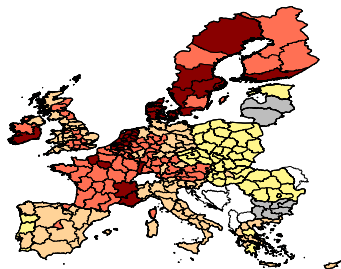
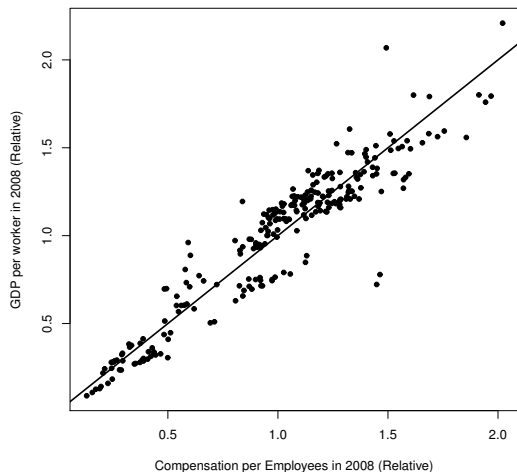


Figura: Compensations per employee  
in 2008



**Figura:** Compensations per employee versus GDP per worker in 2008



It is not so strict the relationship between compensations per employee and GDP per worker

# Mincer approach to the determination of impact of education

There exists a complementary approach to study the impact of human capital on the wages and, indirectly, with the level of GDP per worker: **the Mincer approach**.

Mincer approach to the determination of wages takes as granted that individual wages are only a function of individual stocks of human capital on the base of the idea that each worker has access to the same level of technology and physical capital, i.e. differences in technology and capital across firms where workers are employed are random.

According to this approach we can calculate:

- **the rate of return to education** (where education is a source of accumulation of human capital)
- **the rate of return to experience** (where experience is a source of accumulation of human capital)

# Growth accounting

Growth accounting is another approach to calculate the contribution of each individual factor to the overall growth.

Assume that production function can be expressed as it follows:

$$Y = F(K, A, H); \quad (3)$$

then take the logarithm of both sides and the first derivative with respect to time:

$$\frac{\dot{Y}}{Y} = \epsilon_K \frac{\dot{K}}{K} + \epsilon_A \frac{\dot{A}}{A} + \epsilon_H \frac{\dot{H}}{H} \quad (4)$$

where:

$$\epsilon_Q = \frac{\partial F}{\partial Q} \frac{Q}{Y}, \text{ with } Q \in \{K, A, H\} \quad (5)$$

is the **elasticity of production to factor  $Q$** .