Quantitative Economics for the Evaluation of the European Policy

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Factor mobility

Two main types of factor mobility:

- Labour mobility
- Capital mobility

Many papers on the effect of factor mobility take into account only one of two. This is however crucial for the result.

For example the famous model by Paul Krugman in 1991 on the emergence of a *core-periphery* structure assume that only skilled workers migrate from one region to the other, while unskilled labour no. It also excludes any type of capital mobility.

Factor mobility (cont.d)

Main determinants of factor mobility:

- Differences in the **actual returns on factors** (i.e. wage, interest rate)
- Differences in the e**xpected dynamics** of some key variables (i.e. differences in expected growth rates of regional income)
- Differences in **provision of public goods** (i.e. differences in health services, welfare benefits, etc.)
- Differences in **local amenities** (i.e. differences in non-economic variables entering in individual well being as climate, cultural norms, social ties, etc.)

We will take into account only the first determinant, even though many studies suggest that the last two determinants are also crucial in the explanation of migration flows among EU countries and regions

Labour mobility

• Labour mobility under usual hypothesis of decreasing marginal product to labour lead to a convergence in GDP per worker if workers migrate according to the differences in wages

• Consider two regions, R (rich) and P (poor), with the following Cobb-Douglas production functions:

$$Y_R = K_R^{\alpha} (A_R L_R)^{1-\alpha} \tag{1}$$

$$Y_P = K_P^{\alpha} (A_P L_P)^{1-\alpha} \tag{2}$$

where K_i is the endowment of physical capital of region i, A_i its level of technological progress, and L_i its level of employment and

$$L = L_R + L_P.$$

Labour mobility (cont.d)

Under the assumption that labour is paid to its marginal productivity (i.e. factor markets are competitive) we have that real wages w in the two regions are given by:

$$w_R = \frac{\partial Y_R}{\partial L_R} = (1-\alpha) K_R^{\alpha} A_R^{1-\alpha} L_R^{-\alpha} = (1-\alpha) \frac{Y_R}{L_R} \tag{3}$$

and

$$w_P = \frac{\partial Y_P}{\partial L_P} = (1-\alpha) K_P^{\alpha} A_P^{1-\alpha} L_P^{-\alpha} = (1-\alpha) \frac{Y_P}{L_P} \tag{4}$$

and the reallocation of labour between the two regions should follow:

$$\dot{L_R} > 0 \text{ and } \dot{L_P} < 0 \text{ if } w_R > w_P, \tag{5}$$

and analogously

$$\dot{L_P} > 0 \text{ and } \dot{L_R} < 0 \text{ if } w_P > w_R. \tag{6}$$

Labour mobility (cont.d)

In a more complex framework the choiche of migration should take into account the **cost of moving**, the **unemployment rate** u, and the fact that this choice has **intertemporal implications**. Therefore:

$$\dot{L_R} > 0 \text{ if } \sum_{t=0}^{T} \frac{(1-u_R)\, w_R(t)}{(1+r)^t} > \sum_{t=0}^{T} \frac{(1-u_P)\, w_P(t)}{(1+r)^t} + \text{Cost of moving}, \tag{7}$$

where T is the length of working life for a risk-neutral worker, and the probability to be unemployed is assumed to be indipendent of history.

Labour mobility (cont.d)

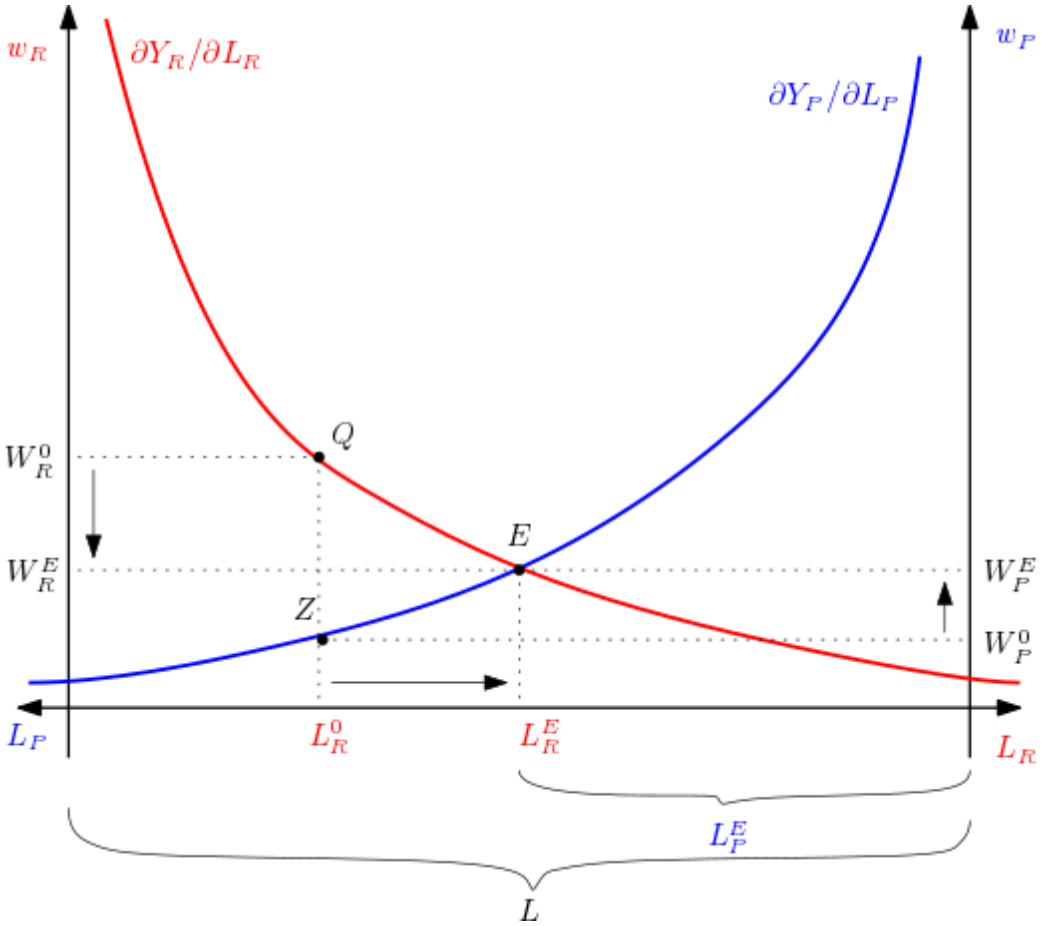

Figure: Allocation of labour between the two regions

- The marginal productivity of labour is assumed to be decreasing.
- If the allocation of labour between the two regions is (L_R^0, L_P^0), then the differences in wages $(w_R^0 > w_P^0)$ causes a reallocation of workers from region R to region P
- This reallocation will continue until wages in the two regions will be equal, i.e. employment will be (L_R^E, L_P^E).

Labour mobility (cont.d)

The convergence of wages poses serious concern in terms of **political feasibility** given that this implies a declined in w^R.

In the real world this declines could be offset by the increase in the accumulation of physical capital and of technological progress. In particular, the dynamics of w^R is given by:

$$\frac{\dot{w}^R}{w^R} = \alpha \frac{\dot{K}^R}{K^R} + (1-\alpha)\frac{\dot{A}^R}{K^R} - \alpha \frac{\dot{L}^R}{L^R} \tag{8}$$

An example can be the dynamics of wages in Germany after the Reunification.

Labour mobility (cont.d)

In E the GDP per worker in the two regions will be the same:

$$w_R^E = w_P^E \Rightarrow \left(\frac{Y_R}{L_R}\right)^E = \left(\frac{Y_P}{L_P}\right)^E \tag{9}$$

• **Migration** is therefore a **strong force of convergence**. This is because there exists a focus of European policy in favour of labour mobility among EU regions and there exists a specific agreement on free mobility of people among the most of EU countries (**Schengen Agreement**).

• Unfortunately this phenomenon was not strong enough so far to reduce the regional disparities, maybe with the exception of migration from regions of Eastern countries.

• There are many reasons for these insufficient migration flows, the difference in **languages** among EU countries is one of the most important, as well as difference in **cultural norms** and existence of strong **social ties**.