

Perfect Competition in the Labour Market

We describe here the working of the labour market that works according to perfect competition.

The perfect competition assumption entails that agents: *i)* are all identical *ii)* have no market power, *iii)* have perfect information, *iv)* can exert perfect flexibility in prices and wages and *iv)* can have immediate and costless match between supply and demand.

This is a very simple case that cannot capture several important features of real labour markets: nonetheless, this simple case is useful to understand the basic mechanisms of labour market. In particular, we will use this model to understand how equilibrium employment and equilibrium wage is determined and how the equilibrium values are reached.

Labour demand and labour supply

Firms perform their economic activities and each of them employs N_i workers using them to produce a certain amount of product Y_i that is sold at market price P . The amount of production depends on the amount of workers employed according to a certain production function $Y_i = f(N_i)$ which exhibits decreasing returns of scale. For a given nominal wage W , the profits of firms are given by:

$$\pi_i = PY_i - WN_i. \quad (1)$$

Firms choose employment to maximise their profits and thus:

$$\frac{\partial \pi_i}{\partial N_i} = P \frac{\partial Y_i}{\partial N_i} - W = 0 \quad (2)$$

and

$$\frac{W}{P} = \frac{\partial Y_i}{\partial N_i} \quad (2a)$$

And, given that firms are identical ($Y_i=Y$ e $N_i=N$):

$$\frac{W}{P} = \frac{\partial Y}{\partial N} \quad (3)$$

Where $\partial Y/\partial N$ is marginal productivity which, given the decreasing returns of scale, is decreasing in N .

Equation (3) determines labour demand N^D , that is, for any level of real wage it tells us what is the amount of workers demanded by firms. Given the decreasing returns to scale, equation (3) implies that the amount of labour demanded is decreasing the level of real wages.

As for workers, we simply assume that labour supply is increasing in the level of wage. This assumption is grounded on the simple logic that, when real wage is high, many workers find convenient looking for a job rather than performing other activities (staying in education, performing domestic work or retiring).

As a consequence, labour supply N^S is a function $N(W/P)$ whose first derivative is positive.

$$N^S = N(W/P) . \quad (4)$$

Employment, Real Wages and equilibrium adjustment

Labour demand (3) and labour supply (4) determines overall employment and the prevailing real wage: graphically this can be seen in Figure 1a.

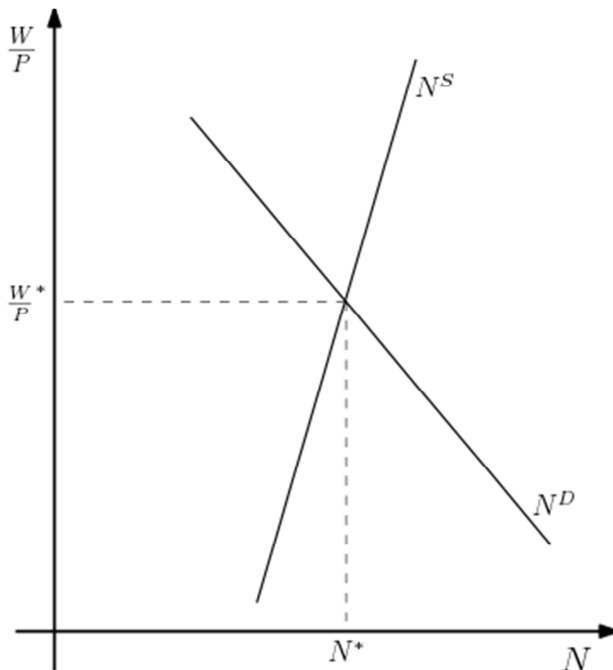


Figura 1a: Employment, real wage and equilibrium

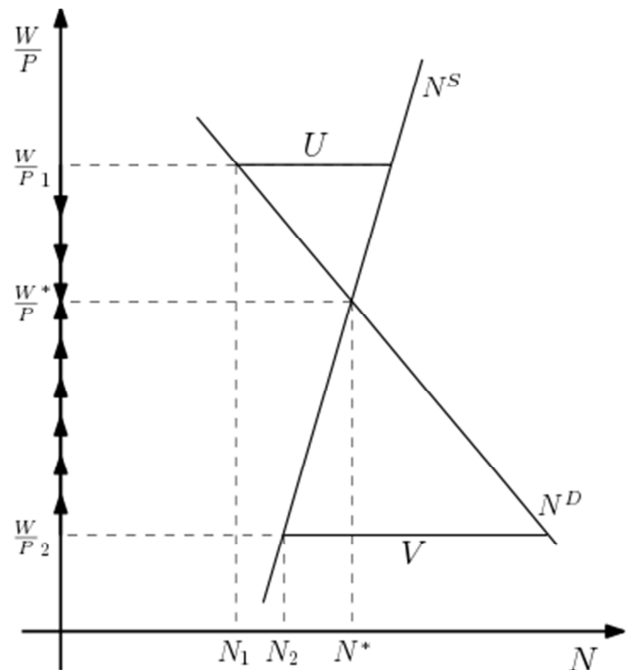


Figura 1b: adjustment process of wage and employment

The intersection between demand curve and supply curves determine equilibrium employment N^* and equilibrium wage W/P^* : for this amount of real wage, labour demand is exactly equal to labour supply; all individuals that desire to work are thus going to find a job and there is thus zero unemployment.

If there are individuals that are not working, this happens because they do not want to work and, therefore they are considered voluntary unemployment.

Let us now analyse what happens if in the system there is a real wage that is different from the equilibrium one. To understand this case, let us consider Figure 1b and suppose that wage is at a level W/P_1 that is higher than the equilibrium one

In this circumstance wage are rather high and, as shown in the figure, the workers that desire to work are more than the amount that the firms are willing to hire: as a consequence, the actual amount of worker that are effectively employed is simply equal to the labour demand (N_1 in the figure) and given that labour supply is larger than that amount, in the market there exists involuntary unemployment (the segment U in the graph).

In anycase, as a consequence of these unemployment, some workers will be willing to work even for a wage that is lower than W/P_1 : as a matter of fact, in the figure, it is possible to see that for wages that are lower than W/P_1 the amount of workers is larger N_1 . Therefore, *if wages are flexible*, workers will offer themselves for lower wages and the actual real wages goes down: this process keeps going as long as labour

supply exceed labour demand, that is, until real wages reach its equilibrium level W/P^* . Therefore, a perfectly flexible labour market will eliminate any supply excess and no unemployment will be present.

Only in the presence of wage rigidities we can observe involuntary unemployment: for example, if wages were forcibly set at the level W/P_1 and there was no possibility to reduce it (as in the case of minimum wage law or union bargaining), then we would observe involuntary unemployment in the system.

Note also that the same adjustment mechanism would operate, symmetrically, if the real wages was below the equilibrium level (as in $\frac{W}{P_2}$ in the figure): in this case, labour demand is larger than supply and in the system we observe an employment level N_2 . Therefore, not all labour demand is satisfied

And in the system we observe vacancies (the segment V in the figure): the presence of vacancies force the firms, in order to fill them, to increase wages offered and this bring real wages at W/P^* and the system reach again the equilibrium.