THE ECONOMIC APPROACH TO THE LABOUR MARKET

Main assumptions of the baseline neoclassical model (1)

- In the labour market **buyers** (firms, labour demand) and **sellers** (individuals, labour supply) of labour exchange labour services for pay. **Wages** are the price of labour services.
- **Agents (buyers and sellers) are rational**: on the basis of their tastes and constraints they try to maximise their objective function. The objective of buyers (firms) is to maximise profits; the objective of sellers (individuals) is to maximise utility.

Main assumptions of the baseline neoclassical model (2)

- **Markets are competitive**. There are many sellers and buyers which are price takers: they cannot affect wages or prices which are completely flexible and are set only by the movements of demand and supply. The equilibrium wage and price are those determined by the equality of demand and supply.
- **Individuals and firms are homogenous**
- **Individuals and firms have a complete information** on labour market conditions
- There are **no constraints to labour and firms' mobility**

Labour supply

At the aggregate/macroeconomic level, labour supply is the results of the aggregtion of individuals' decisions relative to:

- ✓ Labour market participation
- ✓ Fertility decisions and migration flows which define the size of the working age population

At the microeconomic /individual level, labour supply is the result of the individual choice between work (which determines consuption possibilities) and leisure (which increases the well being of the individual)

LABOUR SUPPLY at the individual level (1)

➢**The labour force (LF) function/curve** represents the size of the labour force at different levels of the real wage (W/P). We assume that aggregate participation increases with the real wage.

➢**The labour supply function (Ls)** represents the behaviour of the sellers of labour. It indicates the amount of work that individuals or groups are willing to supply at each wage rate. Labour supply depends on:

- Individual tastes and preferences
- The real wage rate
- Non labour income (which depends also on the system of welfare support such as unemployment benefits or subsidies).

The individual maximise her/his utility function (which depends on her/his preferences in relation to consumption and leisure) **under an income and time constraint** (which depends on the income she/he may get either working or not and the time available**):**

$$\max_{C,T} \quad U(C, T)$$

$$s.t. \quad C = \frac{W}{P} L + \frac{X}{P}$$

$$T_{max} = T + L$$

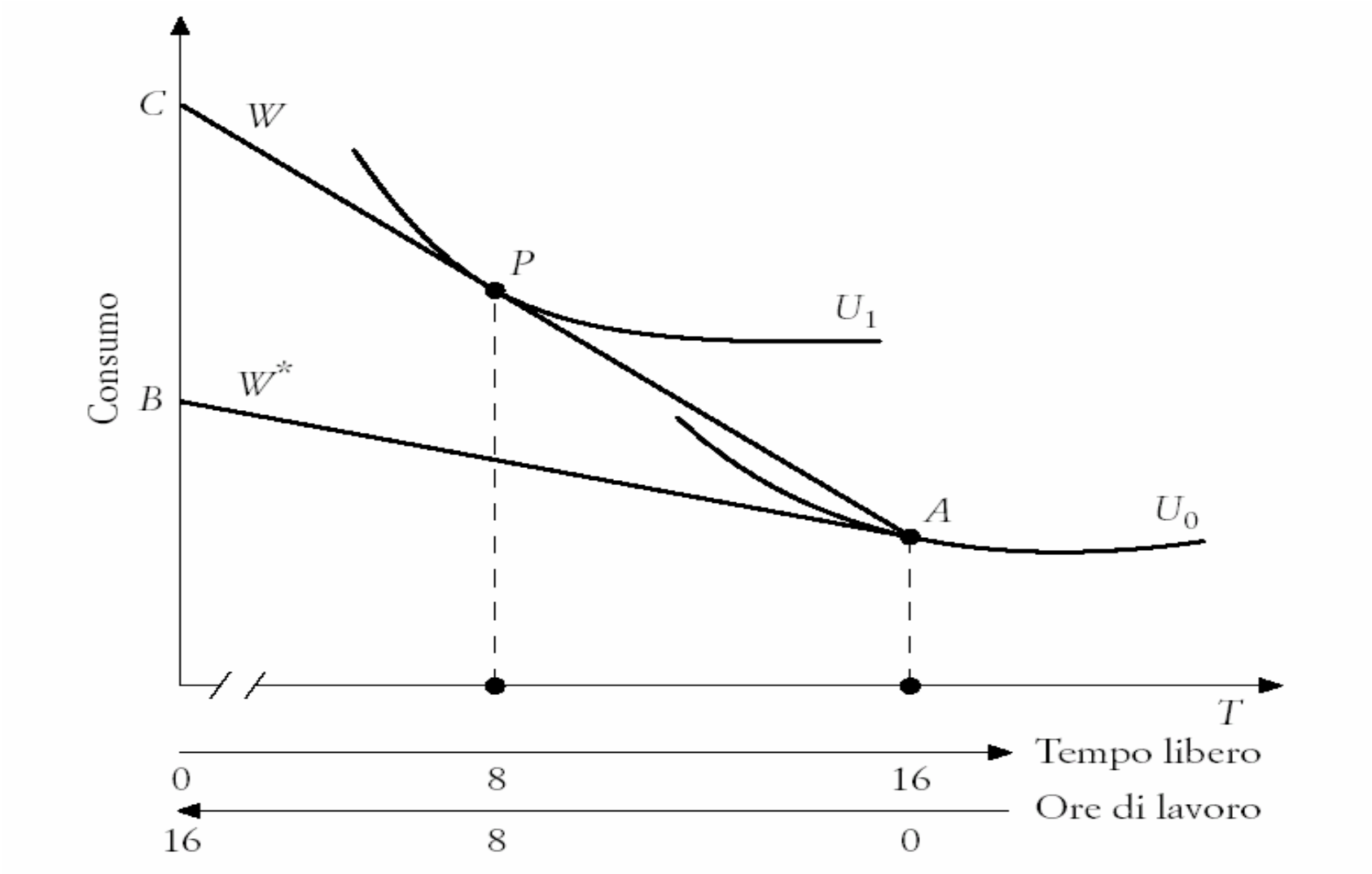
LABOUR SUPPLY (2)

- On this basis decision to participate to the labour markets depends on the **comparison between the (net of taxes) market real wage and the reservation wage.** The individual participate only if the market wage is greater then the reservation wage.

- **The reservation wage** is the highest wage below which individuals do not wish to work. The reservation wage depends on non labour income and preferences.

- Changes in **non-labour income and tastes** shift the position of the supply curve, while changes in the real wage result in movements along the supply curve

Labour supply at the individual level



LABOUR SUPPLY (3)

- Any **rise in the real wage** (W/P) generates two opposite effects:

  a) the increase in the opportunity cost of leisure and home production generates a subsitution of work for leisure

  b) the increase in income will consent to “buy” more leisure and reduce work

- In the short run we assume that, given individuals’ preferences and non-labour income, the quantity of labour supplied is a **positive function of the real wage** (we assume that the substitution effect is higher than the income effect for a relevant range of wages)

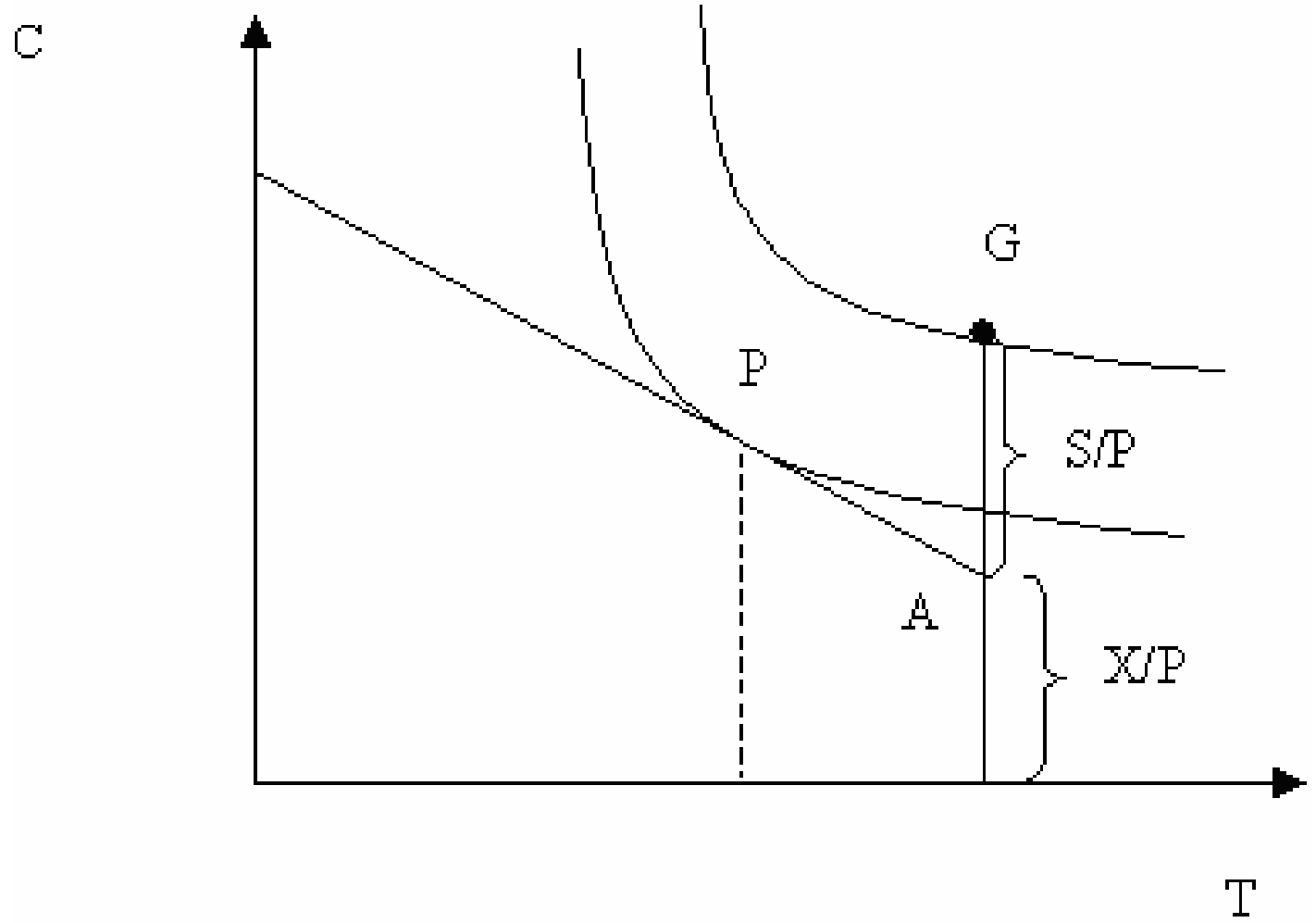
LABOUR SUPPLY (4)

- **A rise in non labour income** (such as unemployment benefits) reduces labour supply, by increasing the reservation wage

- All policies which affect the reservation wage and the market wage affect labour supply: **family composition, welfare subsidies, taxes**. But also employment and working time regulations affect labour supply, especially in the case of *secondary workers (such as married women)* .

- Considering the **household labour supply**, the secondary worker considers the primary worker's wage as non labour income. Hence changes in one component wages, affect not only his/her labour supply, but also the labour supply of other components of the household

Effects of subsidies (non labour income) on labour market participation



LABOUR DEMAND (1)

- The **labour demand curve** represents the demand for labour by a single firm or a group of firms.
- **Labour demand (Ld)** is a derived demand: it depends on the demand for the final commodity that labour helps to produce.
- The firm maximizes its profit function subject to the constraint given by the technology available:

$$\max \Pi = PQ-(wL + rK)$$

$$st\ Q = (K,L)$$

- The **price** that the firm is willing **to pay** for labour is related to the market value of an employee's output (the revenue that the firm obtains from selling the output of labour). For this reason in a competitive market, the demand for labour depends on:

➢ The real wage

➢ The price of other production factors

➢ Labour productivity and the technical possibility to substitute labour with other production factors.

LABOUR DEMAND (2)

- **The demand for labour is inversely related to the real wage** because it is assumed that the marginal productivity of labour increases at a diminishing rate (Law of Diminishing Returns).
- **In the short run** (when capital is given) the firms will hire labour up to the point where: $W/P = MP_l$
- **in the long run** (when capital may be changed) labour demand becomes more sensitive to the real wage because it may substitute capital for labour (substitution effect), besides the scale effect.

Labour demand in the short run

- **In the short run** capital is given and the only way to increase output is to add labour to a given amount of capital
- The firm will hire additional units of labour up to the point where the cost of an additional unit of labour (W) is equal to the revenue coming from an additional unit of labour ($P*MP_L$):
  $W= P*MP_L \rightarrow$ **$W/P = MP_L$**
- The labour demand function in the short run is then:

$$L = L(W / P, \overline{K})$$

- **The demand for labour is inversely related to the real wage** because it is assumed that the marginal physical productivity of labour increases at a diminishing rate as labour input rises (Law of Diminishing Returns).

Labour demand in the long run/1

- **In the long run** (when capital may be changed), the firm has to choose :

  i) the optimal combination of K and L: i.e. the one which minimise costs for each level of production

  ii) the optimal production level.

- The **isoquant curves** show the different combinations of K and L which produce the same amount of output Q. Their slope measures how easy it is to substitute one factor for the other.
- The **elasticity of substitution** measures how easy it is for the firm to substitute labour for capital, when relative factor prices change. Two extreme cases:

➢ If elasticity of substitution **=0** labour and capital are perfect complements (they have to be used together and in the same proportion for each level of production)

➢ If elasticity of substitution =∞ labour and capital are perfect substitute

Labour demand in the long run/2

- The optimal combination of K and L for each level of production is the one which *minimise costs for each level of production*
- **Total cost function** is: **C= WL + RK. Isocosts curves** show the combinations of K and L which give the same amount of total costs, given factor prices. Their slope is given by relative factor prices (W/R).
- In order to minimise costs the firm will hire labour up to the point where:

$$\mathbf{MP_L / MP_K = -W/R}$$

And the labour demand function is: **L = L (W/P, R/P)**

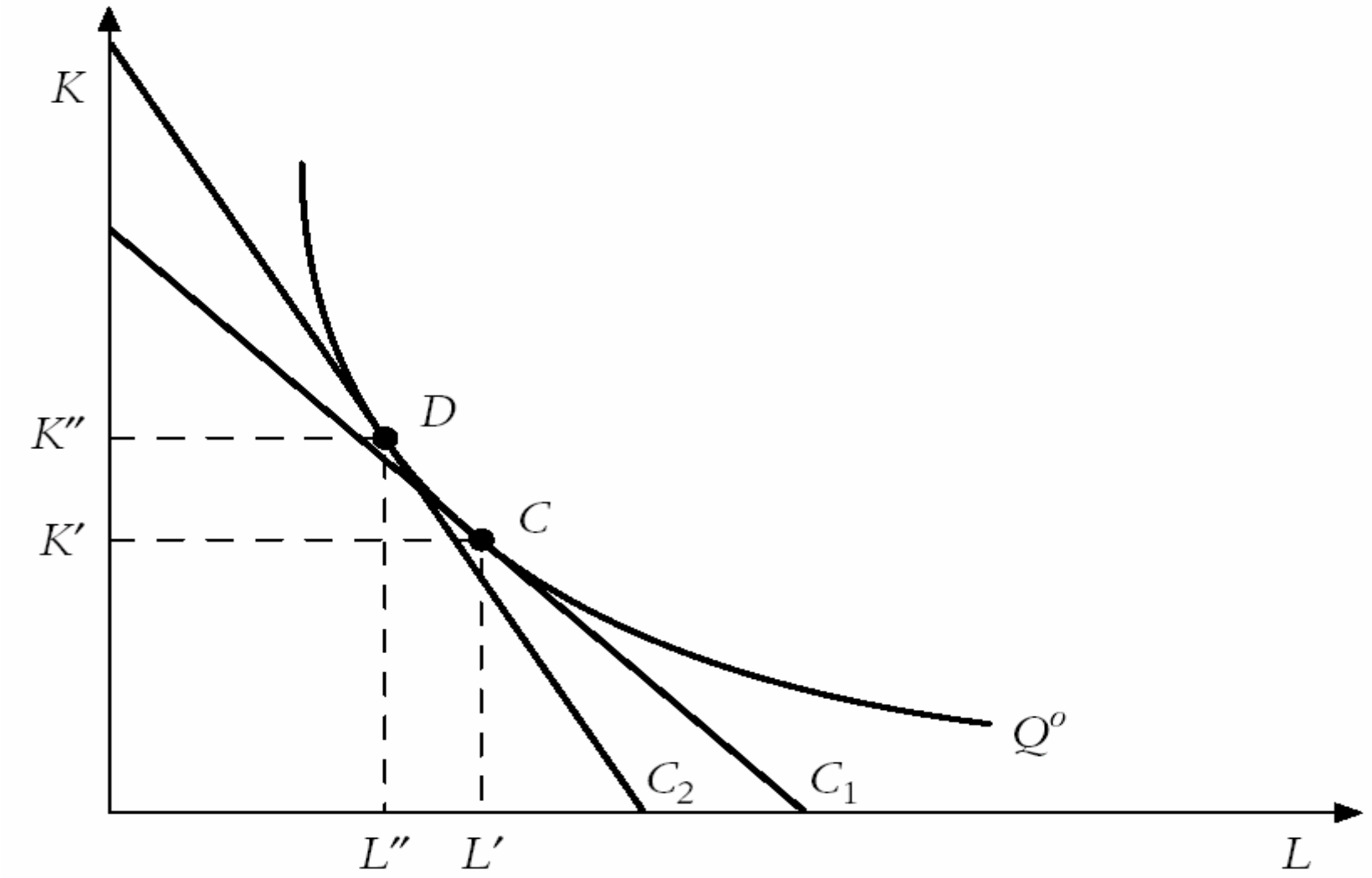
- In the long run an increase in the real wage will reduce the demand for labour due to:

➢ A substitution effect: for each amount of production firms will use more capital than labour (**substitution effect**)

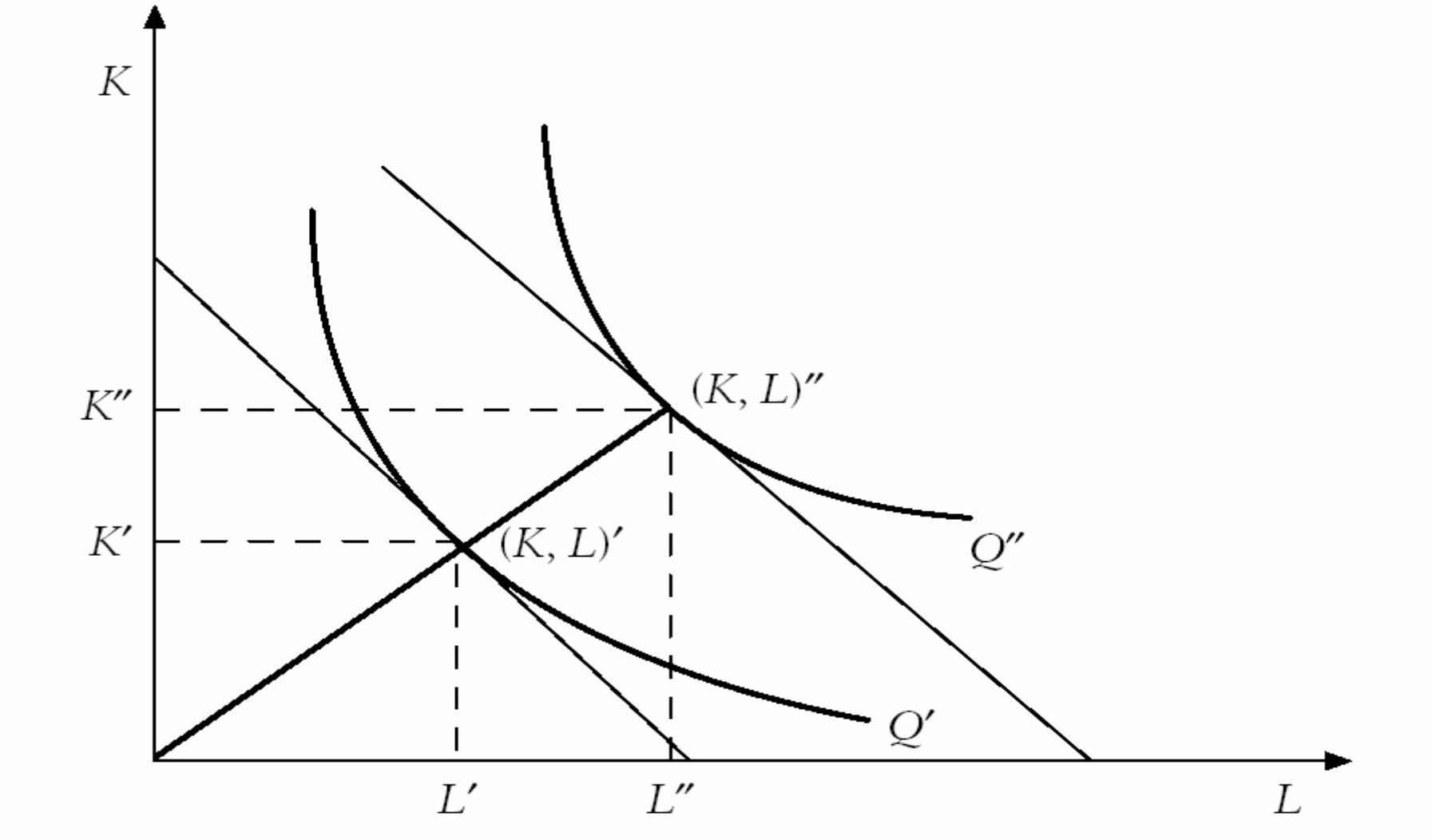
➢ Since labour is more costly the total production costs will increase and, since prices are given for each competitive firm, firms will reduce output (**scale effect**)

For these reasons in the long run labour demand is more sensitive to the real wage (flatter curve).

Effects of a relative increase in wages: the substitution effect



Effects of a relative increase in wages: the scale effect



The wage elasticity of labour demand

- The **wage elasticity of labour demand** to a given change in the real wage in the long run will depend upon (Marshall rules):

a) How sensitive is the demand for the firm's product to changes in prices

b) The ease of substitution of capital for lab our

c) The relevance of labour costs in total production costs

d) The elasticity of supply of substitute factors of production

- For these reasons the wage elasticity of labour demand is higher (and the demand curve flatter) at the industry level relative to the firm's level

LABOUR MARKET EQUILIBRIUM in perfect competition models/1

- The labour market is in equilibrium when:

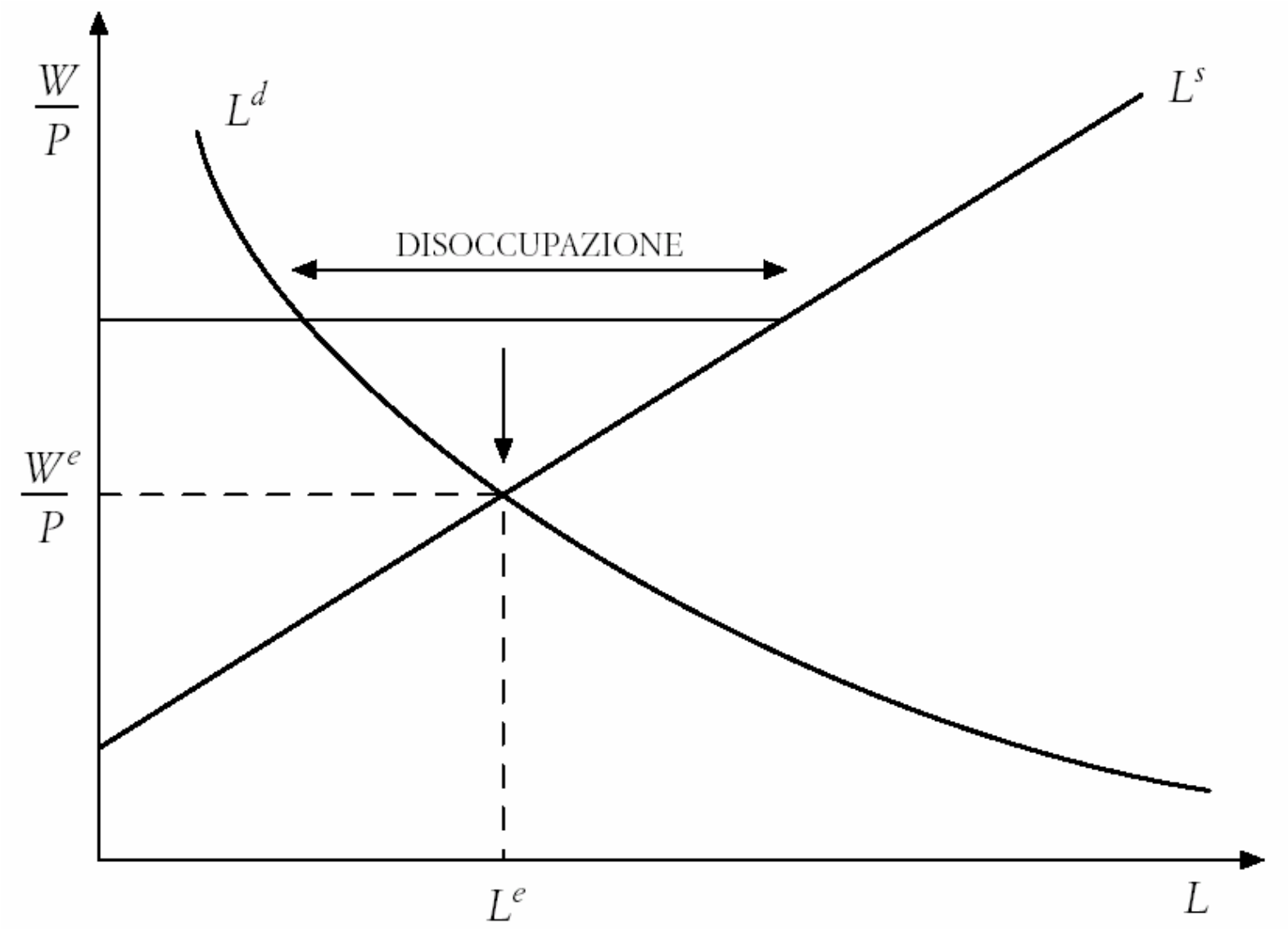
Ls =Ld

- At the equilibrium we have an equilibrium employment L* and real wage W*/P.
- This equilibrium is reached because there is perfect competition, wages and prices are completely flexible and there is mobility of factors.
- **Unemployment** is defined as an excess supply at the prevailing wage rates. **At the equilibrium there is no involuntary unemployment and inflation is stable.**

LABOUR MARKET EQUILIBRIUM/2

- In equilibrium there may be only some ***frictional unemployment*** (those who are changing jobs or are looking for their first job) and, in the short run, ***structural unemployment*** (due to skill mismatches). In the long run this structural unemployment would not persist if wages are perfectly flexible and markets are free to adjust.
- In these flexible labour markets wage differentials compensate for differences in individuals' productivity and job characteristics and have an important allocative function.
- The equilibrium rate of unemployment is called "**natural rate of unemployment**". Those who are willing to work at the equilibrium real wage do work, those who have a higher reservation wages are out of the labour force.

Labour market equilibrium in perfect competition



The neoclassical equilibrium

- The neoclassical model does not represent the real labour markets, but it is useful as a *benchmark* and in order to explain the possibile causes of unemployment.
- At the neoclassical equilibrium:

➢ There is **no involontary unemployment**

➢ The **allocation of resourcers is the most efficient** (wealth is produced at minimum cost) and the best possibile (**Pareto optimum**: it is not possibile to improve the situation of one agent without reducing that of another)

➢ **Wage differentials** are due either to differences in workers' productivity (heterogenous workers) or to differences in job conditions (compensating differentials)

Extensions to the basic neoclassical model (relaxing the assumptions)/1

- **Heterogenous workers and jobs:** wage differentials in the long run reflect differences in workers productivity (which may be gained by investment in human capital,i.e. in education, training and experience) or job characteristics (safety levels, working conditions, etc.). The adjustment mechanism takes time and disequilibrium wage differential may persist for a long time.
- **Imperfect competition in the product market**: if firms define prices, they impose a mark up over costs to have higher profits. Hence prices are higher and product and employment levels are lower than in a perfect competition market.
- **Trade unions:** try to impose higher wages than in perfect competitions

Extensions to the basic neoclassical model/2

- **Imperfect and costly information**: markets' adjustment will take time if there is incomplete information.

➢ Inter-firm wage differentials and (volontary) unemployment may persists, since firms' do not hire the first applicant and workers' do not accept the first job available, preferring to search for better matching.

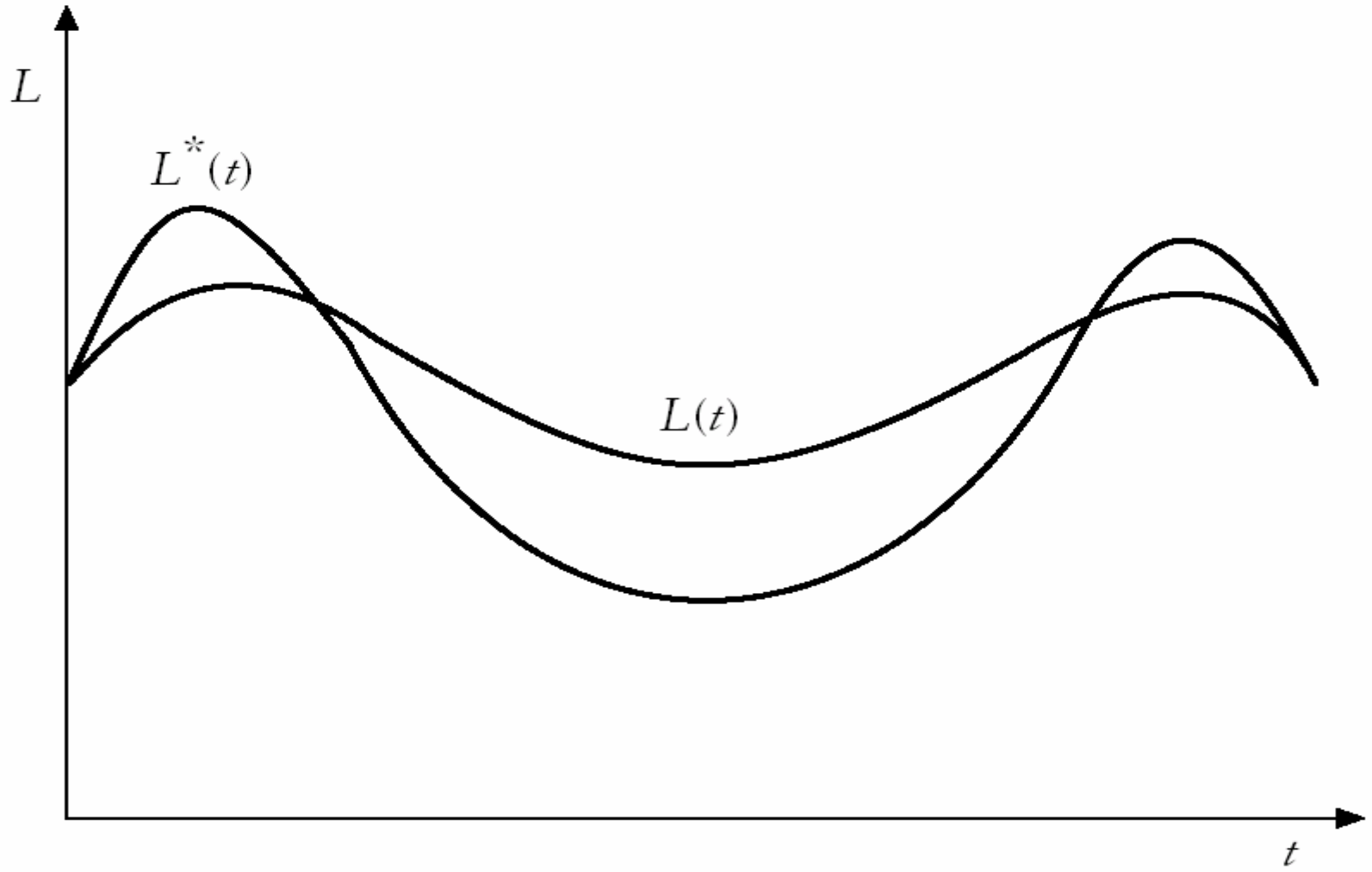
➢ In these models individuals are volontary unemployed in order to search for better jobs. Unemployment benfits and welfare benefits which reduce the cost of search increase unemployment

- **Adjustment and turnover costs**:

Extensions to the basic neoclassical model/3

- **Adjustment and turnover costs**: Labour costs include a **variable component** (hourly wages) which depends on time worked and a **fixed component** (adjustment costs, such as hiring and firing costs, training costs) which depends on the number of workers.
- Due to these fixed costs, a firm wishing to adjust its workforce to changing economic conditions may find it costly to make quick changes: high hiring costs and high firing costs may discourage firms from expanding employment during economic expansions and from reducing employment during recessions (*labour hoarding*), if these fluctuations are considered temporary.
- High adjustment costs may thus reduce employment fluctuations over the business cycles, but also increase labour market segmentation and long term unemployment among outsiders (usually women, young and older people) and wage pressures by the insiders.

Employment variation with variable adjustment coststst



THEORIES OF UNEMPLOYMENT (1)

NEOCLASSICAL MODELS

- In a competitive labour market, wages and prices adjust in order to clear the market: **it is not possible to have involuntary unemployment** unless there are **distortions in the functioning of the labour market due to labour market regulations:**

➢ Real wages too high and sticky (due to minimum wage legislation or union power or efficiency wages, or imperfect competition or high adjustment costs)

➢ Information imperfections which lead to misperceptions on prices and wages

➢ Welfare benefits too generous (search models)

- **POLICY RECOMMENDATIONS**: let the market adjust. Reduce regulations and real wages by operating on the supply side. Unregulated labour markets have a natural tendency to clear and involuntary unemployment will not persist in the long run.

THEORIES OF UNEMPLOYMENT (2)

KEYNESIAN MODELS

- There is involuntary unemployment due to insufficiency of aggregate demand and wages/prices stickiness (due to imperfect competition in all markets).
- Since wages and prices do not adjust quickly and completely, firms are constrained on the amount of output they can sell in the product market. When aggregate demand is low, firms hire little labour. Because of unemployment individuals have lower incomes and reduce consumption, further reducing aggregate demand.

- **POLICY RECOMMENDATIONS**: reducing wages may only aggravate the lack of aggregate demand. To reduce unemployment we have to increase demand through demand side policies (fiscal and monetary policies)

WHY WAGES ARE RIGID?

- **Causes external to the firms:** minimum wages, union power, employment regulations determined by the actions of governments (regulation) and/or unions which introduce **distorsions** in the functioning of the labour market
- **Causes inside the firms:** employers action to increase productivity and effort from workers (efficiency wages), different degrees of risk aversion (implicit contracts)

External causes of wage rigidity/1

1. **MINIMUM WAGES**

2. **UNION POWER:** Unions increase the bargaining power of workers, reducing competition in the labour market.

- There is a **wage setting curve above the individual labour supply curve**.
- The slope of the wage setting curve reflects the relative bargaining strength of unions, which increases as employment increases. The market clearing real wage is higher than in the competitive case, employment is lower and there involuntary unemployment.
- Unions end up representing the employed (insiders), not the unemployed (outsiders), especially when bargaining at the industry level.

External causes of wage rigidity/2

3. EMPLOYMENT REGULATION

- If employment regulation limits dismissals, the costs of labour (adjustment costs) perceived by the firm increases and they are more reluctant to hire in good times, because they worry about the consequences in bad times.
- Moreover employed workers are less likely to be dismissed and increase their bargaining power. They may ask for higher wages without fearing to lose their job and, again, there is a **wage setting curve** above the individual labour supply one.

4. IMPERFECT COMPETITION IN THE PRODUCT MARKETS: firms have the power to impose a mark up over production costs and their *price setting curve* is below the labour demand curve in perfect competition. In addition they may share the rents due to non competition with their workers.

Internal causes of wage rigidity (1)

1. efficiency wages

Firms are willing to pay wages higher than the equilibrium ones, in order to improve workers' productivity, for example by:

- Attracting the best applicants and keeping them (turnover models)
- Maintaining high the workers' morale and involvement in the firm
- Avoid shirking

There is a **wage setting curve** above the labour supply one, the equilibrium real wage is higher than in the competitive model, employment lower and unemployment higher.

Internal causes of wage rigidity (2)

2. IMPLICIT CONTRACTS

- Employees are more risk averse than employers. Employers offer an implicit contract to workers which includes a wage-employment package lasting some years where the variability of wages is minimised: the employer provides an “insurance” against wage declines.

- With these contracts real wages are more stable: they do not decline during recessions, while employment is more variable than in competitive markets.

Equilibrium in non competitive markets: the NAIRU model (1)

The Nairu model summarises the different cases considered before, because considers the possibility of imperfect competition in the labour market and product markets.

In most economies there is imperfect competition in the labour market: collective bargaining set wages, firms set prices. In these economies the relevant curves are:

- the *wage setting curve (Ws)*, which is *above* the Ls and reflects the bargaining power of unions (or workers)
- the *price setting curve (Ps)*, which is *below* the Ld curve, and reflects the market power of firms over prices.

• If claims over output by firms and workers (unions) are conflicting, each party uses its market power to raise prices or nominal wages in an attempt to realise its claim.

• The result is rising inflation. In the short run, the only way to reduce inflation is to increase unemployment.

THE NAIRU (2)

- In these economies the NAIRU (non accelerating inflation unemployment rate) is the unemployment rate at which the competing claims on output by firms and workers are reconciled and inflation is constant. It is set where the wage setting and the price setting curve intersect.
- The NAIRU changes if one or both these curves shift.

➢ The *Ws* curve may shift due to changes in union power, employment protection regulation, unemployment benefits, mismatches, demographic changes, etc.,

➢ the *Ps* may shift due to technology or productivity changes, factor prices, firms market power, terms of trade, etc.

THE NAIRU (3)

- In these economies the NAIRU (non accelerating inflation unemployment rate) is the *long run equilibrium rate of unemployment* at which the competing claims on output by firms and workers are reconciled *and inflation is constant*. It is set where the wage setting and the price setting curve intersect.
- In the **short run** the unemployment rate may diverge from the NAIRU due to *demand (macro-economic) policies*, but in the **medium/long term** the economy returns to the NAIRU as inflation stabilises.

Policy Implications

- The NAIRU is a long run equilibrium rate of unemployment which only depends on structural supply factors. The policy conclusions are similar to the classical model (it is a neoclassical model).
- Since in the long run the NAIRU is determined only by supply factors, only structural policies acting on the labour and the product markets may affect the NAIRU
- Macroeconomic policies which affect aggregate demand are not effective in the long run, they only affect the short run (cyclical) unemployment rate, but not the long run structural unemployment rate (NAIRU)
- In the short run it is possible to reduce the unemployment rate with macroeconomic policies, but only accepting higher inflation.

Hystheresis models

- These are alternative models to the NAIRU which reintroduce the role of macroeconomic policies in affecting unemployment also in the long run (neo Keynesian models).
- The hypothesis is that an increase in short run unemployment may affect the long run unemployment rate when it **persists** for a long time, due to labour market rigidities and the slowness of the adjustment mechanisms determined by:

➢ *Trade unions representing only employed workers (insiders):* insiders gain bargaining power when employment is low and increase their wage demands, thus not allowing a reduction in unemployment;

➢ Unemployment composed mainly by the *long term unemployed* which are discouraged and do not actively seek work, thus not competing in the labour market

➢ *The long term unemployed become obsolete* and loose their working capacity, firms do not want to hire them and they do not compete with employed workers in the labour market

➢ **In these conditions macroeconomic policies may have long run effects on the unemployment rate.**

- In *full hysteresis models*, there is no equilibrium unemployment in the long run, but unemployment always reflects past unemployment rates.