

**Involuntary unemployment**

Involuntary unemployment is the unemployment that occurs when, at the prevailing wage rate in the economy, there are people willing to work but do not get a job (the qualifier ‘involuntary’ is actually redundant).

• **Remark 1.** The following are reasons that have been suggested to explain the existence and persistence of involuntary unemployment:

- wage rates that are “too high” (this is the classical or orthodox explanation);
- insufficient labour demand, due to insufficient aggregate demand (Keynesian explanation);
- existence of market power on the supply side (because of trade unions);
- existence of labour discrimination (whether workers have or not some trait firms value);
- efficiency wages (workers are overpaid to motivate them to be productive);
- structural reasons (an economy does not exist to employ every one willing to be employed).

**The orthodox (or classical) labour market model**

The orthodox labour market is a competitive market model in which price is represented by the real wage  $\omega$  (the nominal or monetary wage  $W$  divided by some price level  $P$ , like the CPI) and quantity is labour (labour supplied and demanded, where labour can be measured as number of persons or as number of hours of work). Fig. 1 represents graphically the orthodox labour market.

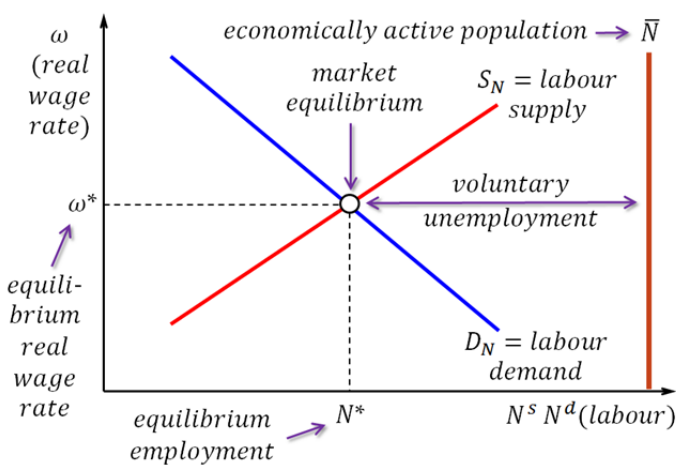


Fig. 1. The orthodox labour market model

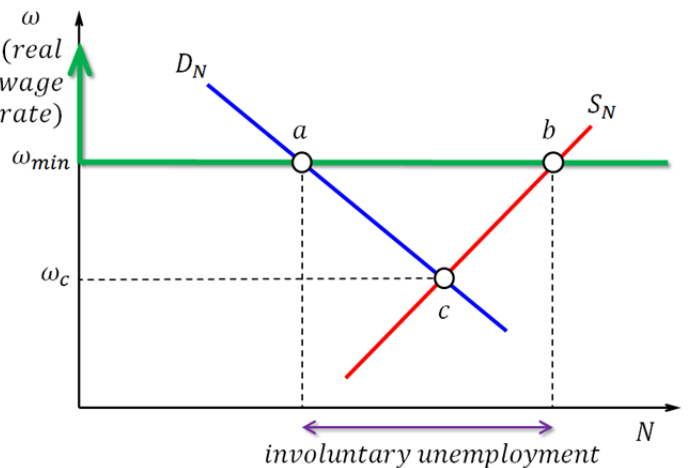


Fig. 2. Minimum wages and involuntary unemployment

• **Definition 1.** The labour supply function in the orthodox labour market associates with each real wage  $\omega$  the total amount  $N^s$  of labour that workers in the economy are willing to supply, up to the maximum labour that can be supplied, which corresponds to the economically active population  $\bar{N}$  (the vertical line at the level  $\bar{N}$  in Fig. 1 could alternatively be depicted as increasing with the real wage  $\omega$ , indicating that more people enter the active population as  $\omega$  grows).

• **Remark 1.** The labour supply function is assumed increasing, at least for an initial interval of wage rates: the higher  $\omega$ , the higher the amount of labour supplied. It is theoretically possible that, for wages above a certain threshold, the labour supply function bends backwards and becomes decreasing: paying too much to workers encourages them to replace hours of work by hours of leisure. Despite this, the labour supply function is assumed increasing because such wage threshold is likely to be too high compared with average wages in an economy and, hence, the possible decreasing section of the labour supply function is not relevant.

• **Definition 2.** The labour demand function in the orthodox labour market associates with each real wage  $\omega$  the total amount  $N^d$  of labour that firms in the economy are willing to hire.

How the orthodox view constructs the labour demand function

Take any firm using labour to produce a certain commodity by means of a production function  $q(n)$  establishing the amount of the commodity that can be produced with  $n$  units of labour. Let  $\pi(n) = p \cdot q(n) - W \cdot n$  be the firm's profit function, where  $n$  is the amount of labour the firm hires,  $p$  is the price at which the firm sells (assuming competitive the market for the commodity), and  $W$  is the nominal wage (the monetary cost of hiring each unit of labour).

The aim of the firm is to choose  $n$  to maximize the profit function. Assuming the function differentiable, the first order condition for a maximum is  $\frac{d\pi}{dn} = 0$ . Since the firm is a price taker in the commodity market

$$\frac{d\pi}{dn} = p \cdot \frac{dq(n)}{dn} - W = 0. \quad (1)$$

The derivative  $\frac{dq(n)}{dn}$  is the marginal product (or productivity) of labour, or MPL, function of the firm. The MPL function measures, for each amount of labour  $n$  hired by the firm, the amount of production that can be attributed to the last unit of labour in  $n$ . Loosely speaking, the MPL function indicates how much an additional worker can produce.

The usual presumption is that  $\frac{dq(n)}{dn}$  is decreasing, that is, the first workers are highly productive and but, at least eventually, this productivity decreases: each additional worker contributes to increase production but each time less. Thus, to raise production in a given amount, the firm needs each time more workers owing to the fact that each additional worker is less productive.

• **Example 1.** If  $q(n) = 2 \cdot n^{1/2}$ , then  $MPL(n) = \frac{dq(n)}{dn} = 2 \cdot \frac{1}{2} \cdot n^{1/2-1} = n^{-1/2} = \frac{1}{n^{1/2}}$ . This function is always downward sloping: a rise in  $n$  leads to a fall in MPL.

By (1), the profit maximizing condition is then  $p \cdot MPL(n) = W$ . Equivalently,  $MPL(n) = W/p$ . This expression implicitly defines the firm's labour demand function: the firm hires labour until the marginal product of the last worker (what the firm obtains in real terms from hiring the worker) equals the cost (in real terms) of that last worker (the real wage  $W/p$ ).

• **Remark 1.** The condition  $MPL = W/p$  lies behind the orthodox prescription that real wages should "get in line" with productivity: workers cannot expect to receive a higher real wage without becoming more productive. The condition  $MPL = W/p$  captures the idea that labour is paid according to the value of its marginal productivity:  $W = p \cdot MPL$  (since MPL is amount of commodity produced and  $p$  is the price of the commodity,  $p \cdot MPL$  is the monetary value of what the last worker hired produces).

• **Example 1 (continued).** With  $MPL(n) = \frac{1}{n^{1/2}}$ , the condition  $MPL(n) = W/p$  amounts to  $\frac{1}{n^{1/2}} = \frac{W}{p}$ . Solving for  $n$ ,

$$n = \frac{1}{(W/p)^2} \quad \text{or} \quad n = \frac{p^2}{W^2}$$

This says that the demand for labour is stimulated by a rise in the price of the commodity the firm produces or by a fall in the nominal wage rate. The expression  $n = \frac{1}{(W/p)^2}$  represents the firm's demand for labour. Insofar as a rise in  $\frac{W}{p}$  causes a fall in the demand for labour  $n$ , the firm's demand for labour is a decreasing function of the real wage  $\frac{W}{p}$ .

• **Remark 2.** As the labour demand of each firm is inversely correlated with a certain wage rate, by disregarding the fallacy of composition, one may jump to the conclusion that the aggregate demand for labour in an economy is inversely correlated with the economy's real wage. This is what Fig. 1 depicts: the labour demand function corresponding to the whole economy is assumed downward sloping: the higher the real wage  $\omega$ , the lower the total demand  $N^d$  for labour.

### Equilibrium in the orthodox labour market

The equilibrium real wage rate  $\omega^*$  in the orthodox labour market is the real wage rate such that labour supplied at  $\omega^*$  equals labour demanded at  $\omega^*$ .

• **Remark 1.** Given  $\omega^*$ , there is no involuntary unemployment: everyone willing to get hired at  $\omega^*$  is hired. The orthodox view, in line with Say's law, claims that, if left by itself, the labour market reaches its equilibrium and, as a result, involuntary unemployment cannot arise.

• **Remark 2.** The difference  $\bar{N} - N^*$  can be viewed as voluntary unemployment, as the people represented by  $\bar{N} - N^*$  regard the equilibrium wage rate as insufficient to encourage them to supply labour. On the other hand,  $\frac{N^*}{\bar{N}}$  would be the participation rate.

### Involuntary unemployment in the orthodox labour market

The only way of having involuntary unemployment in the orthodox labour market is that the market real wage rate differs from its equilibrium level  $\omega^*$ .

• **Remark 1.** Establishing a minimum real wage  $\omega_{min}$  above the equilibrium wage rate  $\omega^*$  would generate involuntary unemployment in the orthodox labour market. This possibility is shown in Fig. 2, where market equilibrium occurs at point  $c$ . If the minimum wage rate  $\omega_{min}$  is set, the state of the market is not represented by  $c$  but by  $a$ : although workers are willing to reach  $b$ , firms cannot be forced to hire more workers than the amount given by  $a$ . At the prevailing wage rate  $\omega_{min}$  there is an excess supply, interpreted as involuntary unemployment.

• **Remark 2.** Involuntary unemployment in the orthodox labour market may also temporarily arise if the real wage rate adjusts sluggishly. Fig. 3 illustrates this situation. Market equilibrium occurs initially at  $a$ , with wage rate  $\omega_a$ . The demand for labour function shifts to the left, indicating that, for every wage rate  $\omega$ , firms are willing to hire less workers than before at rate  $\omega$ . The new equilibrium is represented by  $c$ . But if the real wage rate takes time to adjust (decrease), the wage rate in the market may temporarily remain at the initial level  $\omega_a$ . The market is then at  $b$ , where involuntary unemployment exists.

• **Remark 3.** It is the existence of involuntary unemployment in  $b$  that makes workers willing to accept a lower wage rate. The existence of unemployment gives firms more power to set terms with workers: it is easier for a firm to fire a worker not accepting a lower wage because there is a "reserve army" of workers waiting to be hired and ready to accept the lower wage.

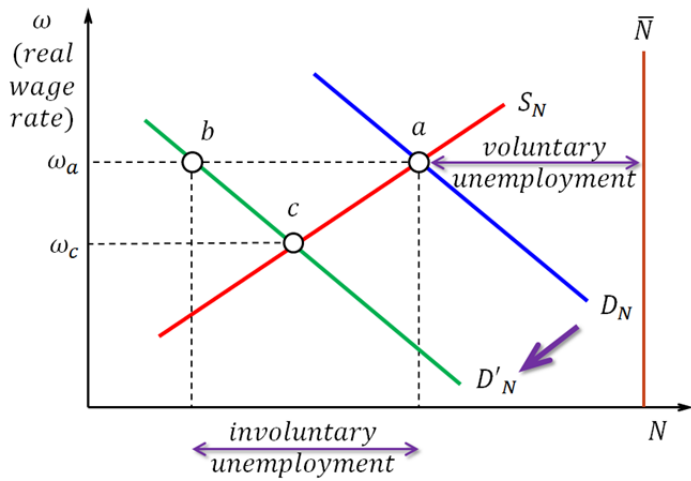


Fig. 3. Unemployment due to sticky wages

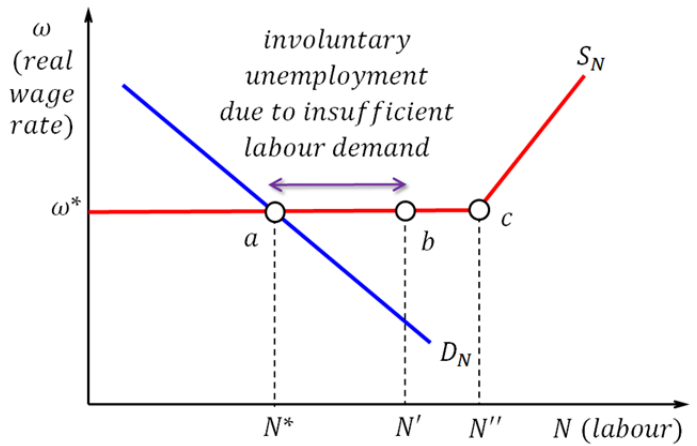


Fig. 4. Unemployment due to insufficient demand

### The NAIRU

The “non-accelerating-inflation rate of unemployment” (NAIRU) is the minimum rate of unemployment consistent with a stable evolution of the inflation rate.

- **Remark 1.** Orthodox economists dismiss the Phillips curve as a worthless construction because of its presumed instability. Yet, they do not seem to question the NAIRU despite the fact that it is an ever-changing value which is hard to identify and calculate.
- **Remark 2.** According to Milton Friedman and followers, the NAIRU (also called “natural rate of unemployment”) is the sum of the frictional rate and the structural rate of unemployment. When the economy reaches the natural rate, it is not only supply and demand for labour that agree but also the people’s expectations (particularly those relative to the inflation rate) prove to be correct. In the long run expectations are correct. In the short run information may be imperfect. Hence, the rate of unemployment could differ from the natural rate because agents lack perfect information.
- **Remark 3.** In the long run, the NAIRU is supposed to determine the economy’s potential GDP.
- **Remark 4. NAIRU economics (1).** The NAIRU is presumed to depend on those regulatory interventions in the labour market that deviate the market from the orthodox labour market model. These interventions include minimum wages, wage-bargaining institutions, employment protection legislation, and unemployment benefits. The more the market is regulated, the higher the NAIRU and the lower potential GDP.
- **Remark 5. NAIRU economics (2).** The NAIRU wisdom holds that demand-side macro-economic policies (fiscal and monetary policies) are mostly ineffective to affect the NAIRU.
- **Remark 6. NAIRU economics (3).** In the NAIRU view, when workers ask for a higher real wage, firms try to protect profits by raising prices, which contributes to fuel inflation. A NAIRU increase would prevent the inflationary pressure by making workers less likely to claim higher wages.

### Involuntary unemployment due to demand deficiency

The orthodox model seems to miss the fact that firms do not hire workers because they want to accumulate workers, who are a means to produce goods and obtain a profit by selling the goods produced. For that reason, the demand for labour by firms is a derived demand: it arises as an intermediate step in the process of reaching the firms’ final goal, which is to make profits.

Accordingly, the demand for labour crucially depends on sales expectations: no matter how cheap labour is, workers will not be hired if firms do not expect to sell what these workers would produce. This is the fundamental insight behind the heterodox explanation of involuntary unemployment: making cheaper to firms the production of commodities by reducing the wage rate is not in general enough to encourage firms to hire more workers. The crucial factor to induce firms to hire more workers is that firms expect to sell what the additional workers will produce.

- **Remark.** The orthodox account emphasizes the role of wages as a cost of production. The heterodox approach also stresses wages as a source of demand for what firms produce and even views higher wages as a stimulus for labour productivity growth and technological progress. The NAIRU theory asserts that wage increases only affect inflation (the NAIRU itself depends inversely on labour productivity: a higher productivity yields a lower NAIRU). But if it is true that higher wages induce firms to develop labour-saving technologies, the fact that such technologies raise the labour productivity implies that the NAIRU cannot be constant and, hence, does not actually exist.

- **Example.** In Fig. 4, market equilibrium occurs at point  $a$ , with associated equilibrium wage  $\omega^*$ . At that wage, the numbers  $N''$  of workers are indifferent between taking a job with wage  $\omega^*$  or not taking the job. This means that any amount between 0 and  $N''$  could represent the supply of labour when the wage is  $\omega^*$  (technically,  $S_N$  is not a function but a correspondence). Suppose that, given  $\omega^*$ , the number  $N'$  of workers would like to work. This means that the distance between  $a$  and  $b$  would then represent involuntary unemployment.

**Involuntary unemployment and trade unions**

Supply-side market power in the labour market is typically associated with the existence of trade unions. For any given amount of labour  $N$ , the wage rate unions demand to supply  $N$  will be higher than the wage rate dictated by the supply of labour function.

- **Remark 1.** This follows from the fact that unions (since they can organize strikes) have more bargaining power over wages than individual workers. Thus, the function  $S_{UNIONS}$  associating with each amount of labour  $N$  the wage rate that unions will ask to be willing to supply  $N$  must lie above the supply of labour function.

- **Example.** Fig. 5 combines the function  $S_{UNIONS}$  with a competitive labour demand function  $D_N$ . Without trade unions, market equilibrium is at  $c$ . With unions market equilibrium is at  $u$ . The distance between  $u$  and  $v$  represents involuntary unemployment: given wage  $\omega_u$ , workers would individually like to supply  $N_v$  but the presence of the union only allows  $N_u$  to be hired.

- **Remark 2.** When the wage is “too high”, the obvious solution to get rid of unemployment is to lower the wage (or let the wage adjust by itself). When unemployment is due to lack of labour demand, the natural solution is an aggregate demand expansion that induces firms to hire more workers to satisfy the additional demand. When the cause of unemployment is market power (unions), the solution seems harder to implement: how to reduce the unions’ bargaining power without raising protests by part of the workers?



**A price setting and wage setting model**

In modern economies, the nominal wages of a substantial number of workers are determined through collective bargaining involving unions. Simultaneously, the prices of goods are directly set by firms.

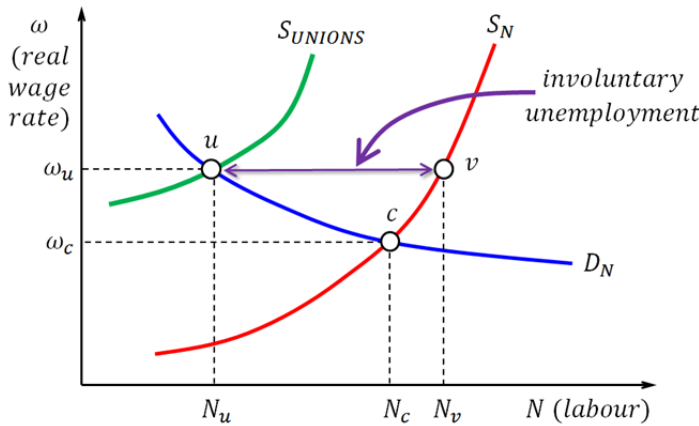


Fig. 5. Unemployment due to trade unions

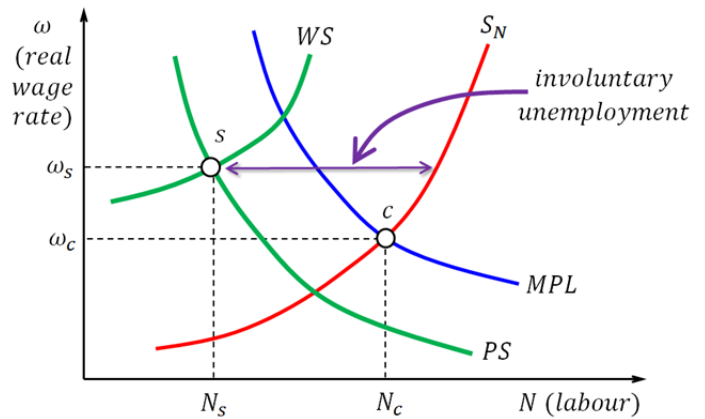


Fig. 6. The PS-WS employment model

• **Workers.** If workers are represented by unions, at any level of employment, the real wage will be above the wage rate dictated by the labour supply function. It is assumed that unions establish the real wage using a wage setting function  $WS$  sloping upward and lying above the labour supply function  $S_N$ ; see Fig. 6. The higher the unions' bargaining power, the larger the vertical distance between the functions  $WS$  (displaying what workers can achieve in terms of wages and jobs when their actions are coordinated by unions) and  $S_N$  (indicating what workers can achieve when they participate individually in the market, without acting in coordination through unions).

• **Remark 1.** The function  $WS$  is increasing is justified by the interpretation of unemployment as a device to discipline the unions' demands for higher wages. When employment  $N$  is small, unemployment is high, for which reason the bargaining power of unions is small: firms could dismiss workers with high unemployment because there are workers willing to accept the conditions that dismissed workers would like to improve. With small bargaining power of unions come lower real wages. Conversely, when employment  $N$  is high, unemployment is low, the bargaining power of unions is high and, as a result, firms are more willing to accept higher wages: if they dismiss a worker, it is harder to replaced him or her due to the low unemployment.

• **Firms.** Whereas workers (through unions) are assumed to set the nominal wage, firms are supposed to fix the prices of the goods they produce. Let  $MPL$  stand for the productivity of the last worker hired by a firm (the marginal productivity of labour),  $W$  denote the nominal wage the firm pays to workers, and  $p$  designate the price of good the firm produces. Then the value  $p \cdot MPL$  of what the last worker produces equals wage  $W$  per worker + profit per worker. Assume that the profit per worker is proportional to the wage: for some constant  $\mu > 0$ , parameter measuring the amount of the workers' productivity appropriated by the firms, profit per worker =  $\mu \cdot W$ . Then

$$p \cdot MPL = W + \mu \cdot W = (1 + \mu) \cdot W$$

or, equivalently,

$$p = (1 + \mu) \cdot \frac{W}{MPL} . \tag{2}$$

Equation (2) could be interpreted as a simple price setting rule for the firm: set the price of the good as by adding a mark-up  $\mu > 0$  to labour costs.  $W$  is measured in money (euros) per worker and MPL in units of product per worker. Thus,  $\frac{W}{MPL}$  is the money paid to workers divided by what they produce:  $\frac{W}{MPL}$  is the (labour) cost of producing a unit of the good (unit labour costs or euros per unit of the good, which are the same units of the price  $p$ ).

• **Remark 2.** Under perfect competition in the labour and product markets,  $\frac{W}{p} = MPL$ . If the prices of goods are set by firms as a marking up of labour costs per worker, then

$$\frac{W}{p} = \frac{1}{1 + \mu} \cdot MPL. \quad (3)$$

• **Remark 3.** Equation (3), which is equivalent to (2), represents the firm's price setting function. Given that  $\mu > 0$ , it follows that  $\frac{1}{1 + \mu} < 1$  and, as a result, the curve described by (3) lies below the curve given by the condition  $\frac{W}{p} = MPL$ .

• **Remark 4.** Under the sloppy presumption that the same reasoning applies to all firms and that the general price level  $P$  can replace the specific price  $p$ , the economy's price setting function  $PS$  shown in Fig. 6 could be somewhat justified and be described by equation (4) (where  $P$  is a general price index.)

$$P = (1 + \mu) \cdot \frac{W}{MPL} \quad (4)$$

• **Remark 5.** As the MPL function is downward sloping, the  $PS$  function is downward sloping as well. By Remark 3, the  $PS$  function lies below the MPL function: workers receive less than their marginal productivity.

• **Remark 6.** An expression like (4) could be obtained directly at the aggregate level. First, from the income approach to calculate GDP,

$$\text{nominal GDP} = \text{wages} + \text{profits}$$

or

$$P \cdot Y = W \cdot N + \text{profits}$$

where  $Y$  is real GDP,  $P$  is a general price index (such as the GDP deflator),  $W$  is the nominal wage, and  $N$  is total employment. Assuming that profits is a constant proportion  $\mu$  of the wage bill  $W \cdot N$ ,

$$P \cdot Y = W \cdot N + \mu \cdot W \cdot N = (1 + \mu) \cdot W \cdot N.$$

Thus,

$$P = (1 + \mu) \cdot W \cdot \frac{N}{Y} = (1 + \mu) \cdot \frac{W}{Y/N} = (1 + \mu) \cdot \frac{W}{APL}$$

where APL denotes the average productivity of labour. If APL and MPL are similar, (4) obtains.

• **Example.** In Fig. 6 the wage and price setting decisions are consistent only at point  $s$ , where, at the prevailing wage  $\omega_s$ , there is involuntary unemployment represented by the difference  $N_c - N_s$  (the competitive solution would correspond to point  $c$ ).

### Efficiency wage hypothesis

The efficiency wage hypothesis holds that the labour productivity of workers depends on the real wage they are paid. This hypothesis justifies the willingness of firms to pay wages (called efficiency wages) higher than necessary and explains why firms might not find profitable to cut wages when unemployment is high.

• **Remark 1.** There are at least four connections between wages and labour productivity. These connections put forward benefits that firms could obtain by paying wages above market levels.

- (i) High wages contribute to reduce or eliminate shirking, as such wages give workers an incentive to work rather than cheat or shirk.
- (ii) When labour turnover is costly for firms, high wages make workers more reluctant to leave the job.
- (iii) In cases in which a worker's productivity (skill, abilities) is positively correlated with the wage the worker demands to accept a job offer, firms paying higher than average wages are more likely to attract better job candidates. Higher wages help to improve the average level of job applicants.
- (iv) High wages improve the workers' morale. The relationship within a firm between employer and employees can be seen as expressing norms of gift exchange. The workers' gift is to supply work in excess of the minimum work that is expected or standard. The firm's gift is to reward workers with a wage higher than could be obtained in another job. The workers then may develop a collective sentiment making for the firm costly to deal with workers individually and, in exchange, as a collective, the workers accept the implicit norm of loyalty to the firm.

• **Remark 2.** If enough firms pay efficiency wages above the market-clearing wage (the equilibrium wage in the orthodox labour market), the average wage will be above the equilibrium level and the ensuing unemployment will be involuntary: the unemployed workers would like to accept a job at firms offering efficiency wages.

### Insider-outsider theory

It is an unemployment theory that makes labour turnover costs a source of unemployment. The theory separates workers into insiders (incumbents) and outsiders (non-incumbents). Insiders participate in the wage setting process and, thanks to their powerful position, force increases in wages, at the expense of outsiders, who would accept a job for wages smaller than those received by insiders.

• **Remark 1.** The existence of turnover costs gives insiders the privilege to get the largest wages that make firms still profitable to grant those wages instead of replace the workers with outsiders. The insiders typically exploit those advantages by acting collectively by means of a union. Outsiders that attempt to enter the firm are in a weaker position because they act individually.

• **Remark 2.** Some turnover costs arise from the different cost of employing insiders and outsiders (hiring and training recruits is costly). Others derive from the ability of insiders to negatively influence the productivity of entrants (insiders refuse to help new recruits, share information with them, or may even harass the newcomers). The higher the cost of replacing the workforce (the less substitutable an insider is by an outsider), the larger the ability of insiders to push wages up.



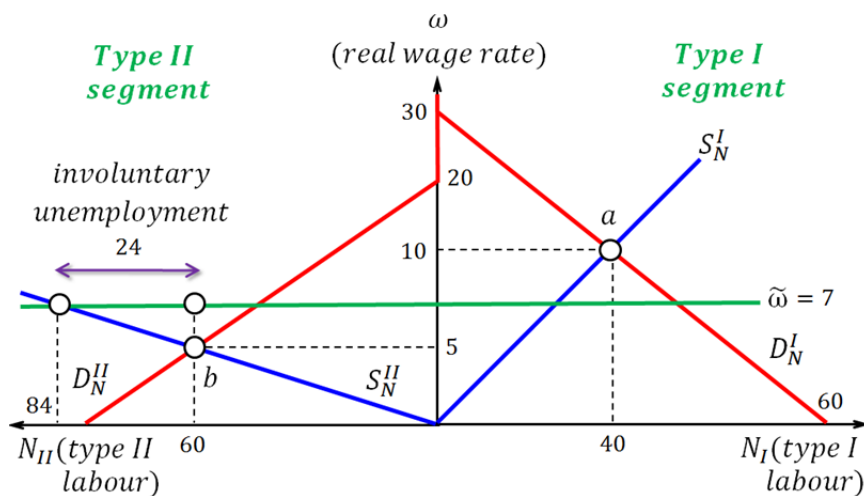
**A segmented labour market model**

Suppose workers may have some (perhaps economically irrelevant) feature that the (owners of) firms may like or dislike (for instance, being a man). Firms classify workers in two types (I and II) depending on whether they possess the feature or not.

Some firms (type I firms) prefer type I workers; the rest (type II firms) prefer type II workers. Each type of firms defines a different competitive labour market. Workers are unaware of the fact that there are two types of firms. From their perspective, the labour market is not segmented.

• **Example.** Letting  $\omega$  designate the real wage rate, the supply of labour function of type I workers is  $S_N^I = 4 \cdot \omega$ . The demand for labour function of type I firms is  $D_N^I = 60 - 2 \cdot \omega$  ( $N_I^d = 0$  if  $\omega > 30$ ). The supply of labour function of type II workers is  $S_N^{II} = 12 \cdot \omega$ . The demand for labour function of type II firms:  $D_N^{II} = 80 - 4 \cdot \omega$  ( $N_{II}^d = 0$  if  $\omega > 20$ ).

The market equilibrium for the type I segment is  $(N_I, \omega_I) = (40, 10)$ . The market equilibrium for the type II segment is  $(N_{II}, \omega_{II}) = (60, 5)$ . In this case,  $\frac{40}{40+60} = \frac{2}{5} = 40\%$  of employment corresponds to type I workers and  $\frac{60}{40+60} = \frac{3}{5} = 60\%$  to type II. Using these weights, the average real wage rate would be  $\tilde{\omega} = \frac{2}{5} \cdot \omega_I + \frac{3}{5} \cdot \omega_{II} = \frac{2}{5} \cdot 10 + \frac{3}{5} \cdot 5 = 7$ . At  $\tilde{\omega} = 7$ , no more type I workers than are actually employed would like to be hired. But, at  $\tilde{\omega} = 7$ , type II workers would like to supply  $S_N^{II} = 12 \cdot \tilde{\omega} = 84$ .



As employment of type II workers equals  $N_{II} = 60$ , there appears to be involuntary unemployment equal to  $S_N^{II}(\tilde{\omega} = 7) - N_{II} = 84 - 60 = 24$ . The unemployment rate is then  $24 / (24 + N_I + N_{II}) = 19.3\%$ . As shown in Fig. 7, each segment is in equilibrium although involuntary unemployment seems to exist.

Fig. 7. Segmented labour market example

**The employment-production-income-spending (E-PIS) model**

The model postulates three linear relations linking employment with production, income, and spending.

(1) EP relation (production → employment): establishes the amount of employment required to reach a certain GDP level; see Fig. 8.

(2) EI relation (income → employment): identifies the amount of labour supplied for every value of aggregate income; see Fig. 10.

(3) ES relation (employment → expenditure): indicates the aggregate level of spending (the aggregate demand AD) associated with any given amount of employment; see Fig. 9.

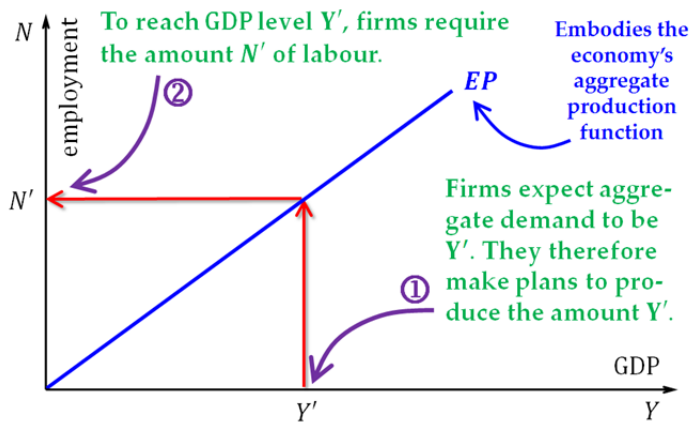


Fig. 8. The production-employment relation

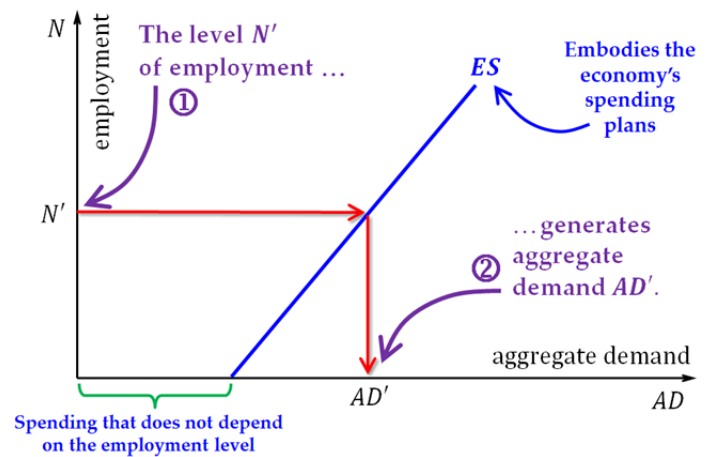


Fig. 9. The employment-expenditure relation

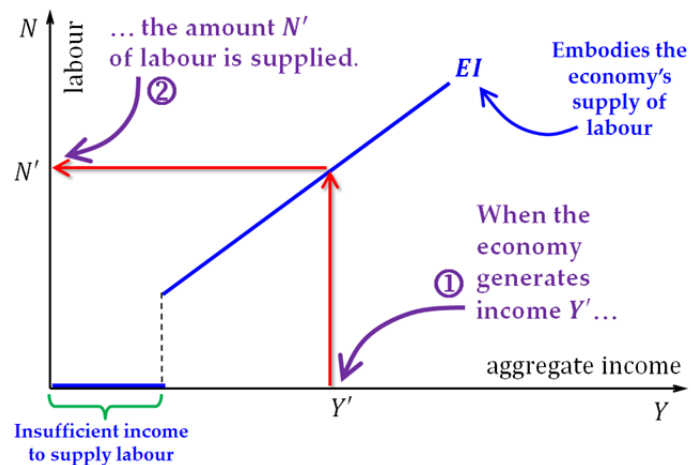


Fig. 10. The income-employment relation

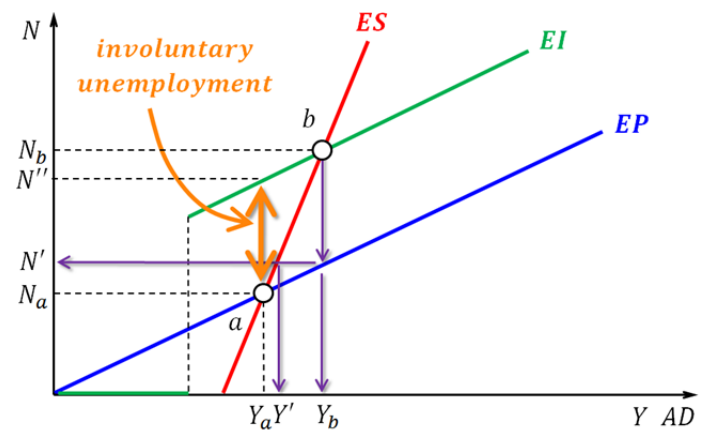


Fig. 11. The E-PIS model

When the three relations are drawn simultaneously, as in Fig. 11, there is no point at which the three lines intersect. Without delving into details, assume that the solution is found at a point when two lines intersect. Leaving the origin aside, there are two candidates: point *a* and point *b*.

Point *b* is not stable in the sense that it is not self-sustained. At *b*, employment is  $N_b$  and aggregate demand is  $Y_b$ . But, according to EP, to produce  $Y_b$ , the economy only needs the amount  $N' < N_b$  of labour. Hence, *b* does not represent a consistent state of the economy.

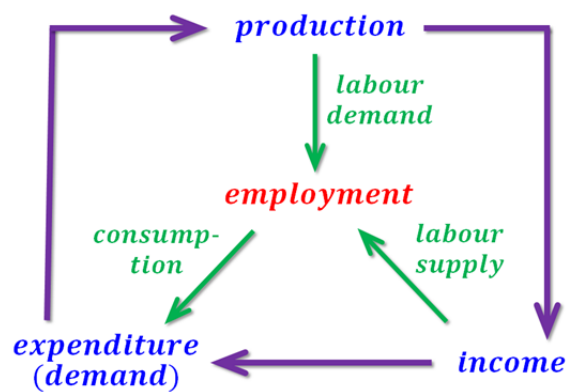
At *a*, employment is  $N_a$  and aggregate demand is  $Y_a$ . To generate a GDP equal to  $Y_a$  firms demand exactly the amount  $N_a$  of labour. In addition, the level  $N_a$  of employment generates precisely the level  $Y_a$  of aggregate demand. This state of the economy appears self-consistent and stable.

The problem is that there is involuntary unemployment at point *a*. Given income  $Y_a$ , workers would like to supply the amount  $N''$  of labour. Since employment at *a* is only  $N_a$ ,  $N'' - N_a$  defines the level of involuntary unemployment. Further investigations of the model are left as an exercise (for instance, what shifts in the lines would reduce involuntary unemployment?).

The arguably simplest description of an economy is given by the loop

... → **production** → **income** → **expenditure** → **production** → ...

The E-PIS model inserts labour in this loop; see Fig. 12. First, production creates a derived demand: the demand for labour. Second, the income the economy generates is a key variable helping workers to decide the amount of labour supplied. Lastly, the level of employment, once determined, significantly contributes to establish aggregate demand, which in turn affects production.



The classical (orthodox) view of this process attributes to the labour market the leading role. Employment is first established, this next determines production, and production is finally used.

The Keynesian (heterodox) view inverts the order. First, expenditure decisions are made. These decisions indicate the necessary production level. Finally, the labour required to carry out the production plan is hired.

Fig. 12. Interpretation of the E-PIS model

The E-PIS model aligns itself with the heterodox view. The state of the economy is foremost determined by the firms' expected level of aggregate demand. To meet the expected demand level  $Y$ , firms hire the amount of labour  $N$  necessary to produce  $Y$ . As long as the income level corresponding to production level  $Y$  induces workers to supply at least  $N$ , the employment-income relation is irrelevant.

Since there is no obvious reason why the EI relation cannot be established independently of the other relations, it is highly unlikely that workers will supply exactly  $N$ . Thus, the excess of labour supplied constitutes involuntary unemployment. As it emerges from the working of the economy itself, it seems that it will be hard to eliminate completely.

**The Marxist view of unemployment**

The Marxist view of capitalism holds that it is a system that experiences a continuous series of crisis. In each crisis inventories of unsold goods rise, production falls, banks go bankrupt, factories close down, and massive layoffs create an expanding and persistent pool of unemployed workers.

- **Remark 1.** Crises in capitalism are considered structural. The logic of capitalism is to increase profits by extracting surplus value generated by workers. The competition among firms to raise profits produces, through the more intense exploitation of the workforce, the unintended consequence of a falling profit rate because the mass of workers do not receive the necessary income to purchase all the production generated by firms. The result is an overproduction (or an underconsumption) crisis, as total production outstrips total consumption.
- **Remark 2.** Globalization has transformed the world economy into an arena where gigantic transnational corporations conduct two strategies that make crises more severe: a worldwide race to the bottom in wages that pits workers of different nations against each other (the 'one big fact': between 1985 and 2000, the world working class increased by 1.47 billion workers) and the development of technological innovations that save labour or facilitate offshoring and outsourcing.

**The horrific trinity**

The ‘horrific trinity’ is the combination of three acute and damaging economic problems: growing inequality (in the distribution of wealth and income), persistent unemployment, and unbearable, excessive, unpayable debt.

• **Remark 1.** The graph below depicts the trinity in connection with the three basic elements of an economy (wealth, work, money) and as set of mutually reinforcing problems.

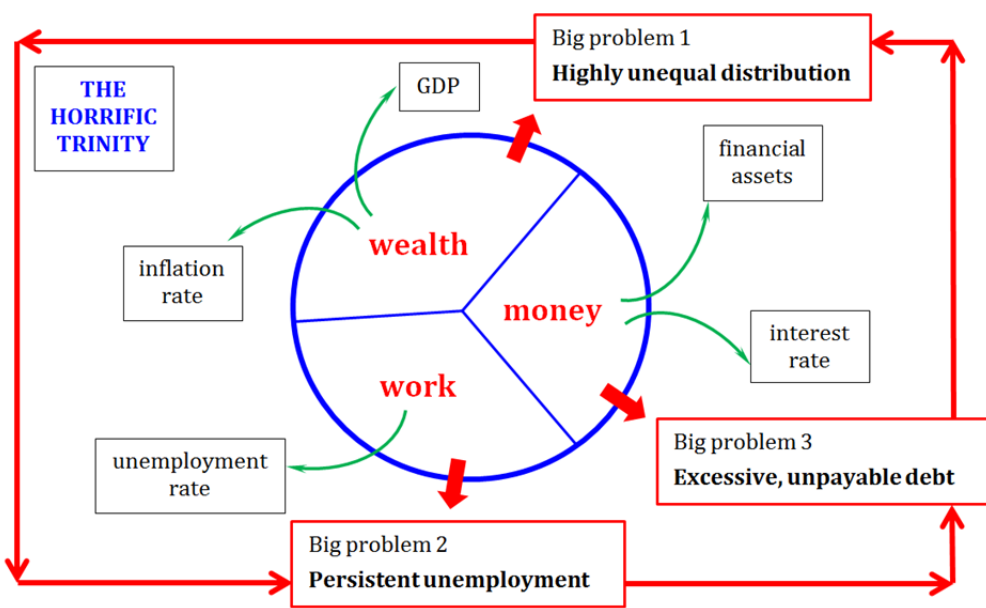
• **Remark 2.** There are at least four connections between wages and labour productivity. These connections put forward benefits that firms could obtain by paying wages above market levels.

(i) An increasingly unequal distribution of wealth and income makes the economy more vulnerable to underconsumption crises, as workers and middle class consumers are unable to absorb the flow of new production. Firms then lay off workers and unemployment escalates persistently. Even if a recovery eventually ensues, it now tends to be a “jobless recovery”. This state contributes to depress wages and to widen the gap separating consumption from production.

(ii) Since the wealthy save more than workers and middle class employees, surplus savings are generated in the economy. Part of those savings are channelled to the less wealthy to make them able to absorb, through consumer credit, the new goods produced. Another part is directed to speculative ventures and schemes in the financial sector, where investors just gamble on results: they try to make money by betting on which financial assets are going to be the winners in the profitability race.

(iii) The fact that the financial sector offers most of the opportunities to obtain large sums of money very quickly, all the activity in that sector reinforces the income and wealth inequalities.

• **Remark 3.** The Marxist image of an international high technology and low-wage capitalism is consistent with the view of a horrific trinity whose constituent problems worsen with time.



“Every business day when that market bell rings, we con people into believing in something, the American dream, family values. Could be freedom fries for all I care. It doesn’t matter as long as the con works and people buy and sell whatever it is we want them to (...) and we all know a con doesn’t work without the confidence.”

Mr. Robot, Season 2 Episode 1