The theory and evidence of unemployment persistence

A review of the literature [*]

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Abstract

This paper presents a survey of the unemployment persistence and hysteresis literature. It investigates the relevance of several mechanisms put forward to explain why a rise of unemployment (due to e.g. monetary or fiscal contraction) may persist. Theoretical and empirical support is found mainly for the hypotheses that unemployment will persist if the employed (insiders) do not care for the interests of the unemployed (outsiders), and if the unemployed quickly lose their skills, motivation and search effectiveness. Further, the paper examines the underlying role of labour market structures and policies: the characteristics of wage bargaining, the extent of active labour market programmes, the characteristics of the unemployment benefit system and of job security legislation.

1. Introduction

Will history repeat itself? If we believe that experience in the 1980s can be relevant to predict labour market developments in the coming years, it is to be expected that the current rise of unemployment will soon confront many OECD countries with the even bigger problem of unemployment persistence: once it is created, unemployment may be hard to get rid of. In the literature various theories and pieces of evidence have been presented to underpin this statement. The aim of this paper is to provide a survey of these theories and evidence. It wants to discover relevant (and irrelevant) mechanisms at work, and thereby contribute to a better assessment of (and response to) the current situation.

The problem of unemployment persistence has become a major research topic since the middle of the 1980s. In those years (1986-88) an empirical puzzle developed which required an explanation. Despite persistently high unemployment, inflation was found to stabilize. It no longer seemed to respond. Figures 1 and 2 illuminate this puzzle, which, as can be seen, mainly showed up in the EC (see also Nickell, 1988).

These facts did clearly not fit conventional wisdom, according to which a stable equilibrium rate of unemployment (or NAIRU) exists and inflation falls as long as the actual rate of unemployment exceeds the NAIRU and rises in the opposite case. At the end of the adjustment of inflation, actual unemployment should have returned to the NAIRU. The only way to solve this puzzle was to *accept the idea that the NAIRU had also risen*. Econometric estimates for various European countries by e.g. Coe (1985) and Layard et al. (1986) confirmed this idea.

The obvious conventional explanation of this rise in the NAIRU had to be found in the area of reduced allocative efficiency in the labour market (e.g. a rise in the mismatch or union power) and increased government intervention (e.g. rising minimum wages, unemployment benefits or tax wedges). Several authors, however, present convincing evidence against this explanation[1]. The policy of structural adjustment and deregulation of the 1980s should indeed be expected to reduce instead of increase the NAIRU.

A second, and more promising explanation of the rise in the NAIRU is the use of the idea of *unemployment persistence (or hysteresis)*. This idea, already referred to by Phelps (1972, p. xxiii and 76-80) in the early 1970s, points to mechanisms in the economy which imply that the NAIRU depends on the time-path of previous actual unemployment. As a consequence, if demand restraint (like in the beginning of the 1980s) pushes unemployment upwards, its unfavourable effects will be propagated over long periods of time because the NAIRU will also rise. At least three different

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[1] See e.g. Sachs (1985), Layard et al. (1986), Blanchard & Summers (1986), Chan-Lee et al. (1987), Coe (1988) and Carlin & Soskice (1990, chapter 19)

channels through which demand restraint may bring about a rise in the NAIRU, are distinguished in the literature:

1) It may generate capital scrapping and, thus, reduce the physical capital stock and the maximum number of jobs available;

2) It may induce unfavourable insider-outsider effects by decreasing the number of insiders;

3) It may generate a reduction of the human capital stock by affecting the skills and motivation of the unemployed, i.e. it may reduce 'outsider-effectiveness'.

We discuss these channels in sections 3, 4 and 5 [2]. Section 6 goes into the underlying role of labour market structures and policies. Section 7 reviews comparative empirical evidence and illuminates why certain countries are much more vulnerable to unemployment persistence (hysteresis) than others. In section 8 we present our main conclusions. First, however, we develop a model of wage and price formation. This model constitutes the basic framework within which our analysis of the NAIRU and of inflation will take place.

2. The 'competing claims' model of the NAIRU and inflation

In this section we present a model for the explanation of the NAIRU (section 2.1.) and inflation (section 2.2.). Like most of the unemployment persistence literature, this model is to be situated in the New Keynesian approach developed by, among others, Layard & Nickell (1986), Layard & Bean (1989) and Carlin & Soskice (1990). It captures what we believe to be the main characteristics of today's real world economies (especially in Europe), i.e. wage bargaining between employers and unions, price-setting by imperfectly competitive firms, labour market intervention by the government and potential conflicts, not only between employers and workers, but also between the employed (insiders) and the unemployed (outsiders).

2.1. Explanation of the NAIRU

The basic idea of the competing claims approach is that, in an economy where both workers (unions) and firms have market power, each group will attempt to obtain a particular share of the economy's product (real income). The NAIRU is the unemployment rate at which these competing claims are reconciled. The equations (1) and (2)

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[2] Muysken & de Regt (1990) distinguish a fourth channel (persistence in structural unemployment) according to which demand restraint and rising unemployment are shown to increase the mismatch and other imbalances in the labour market.

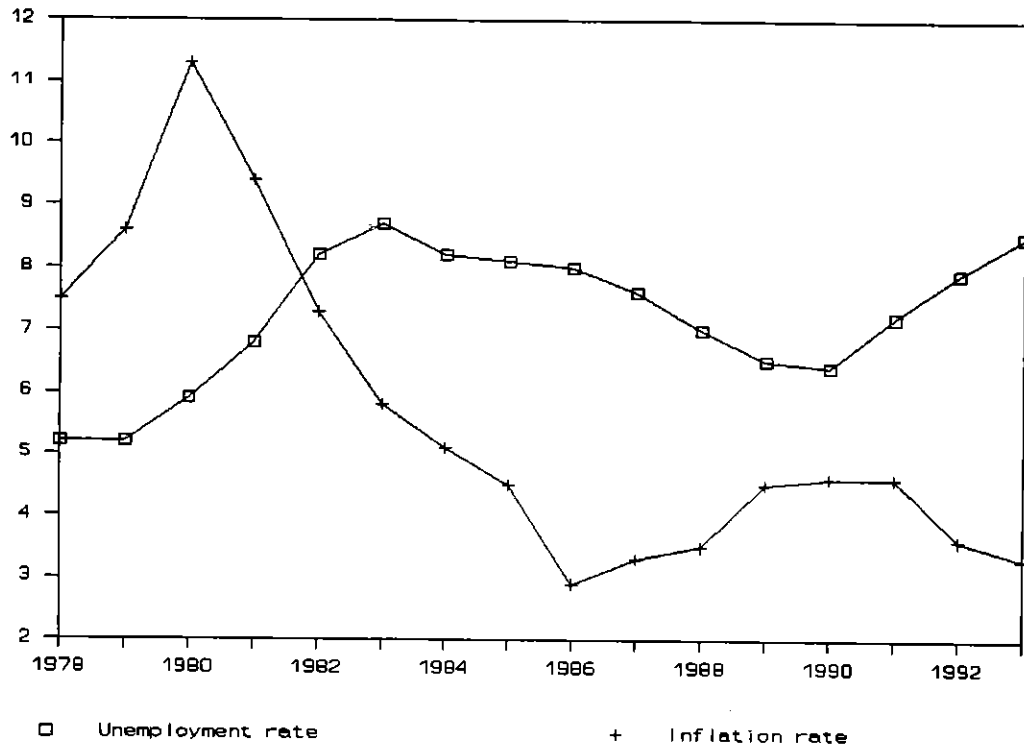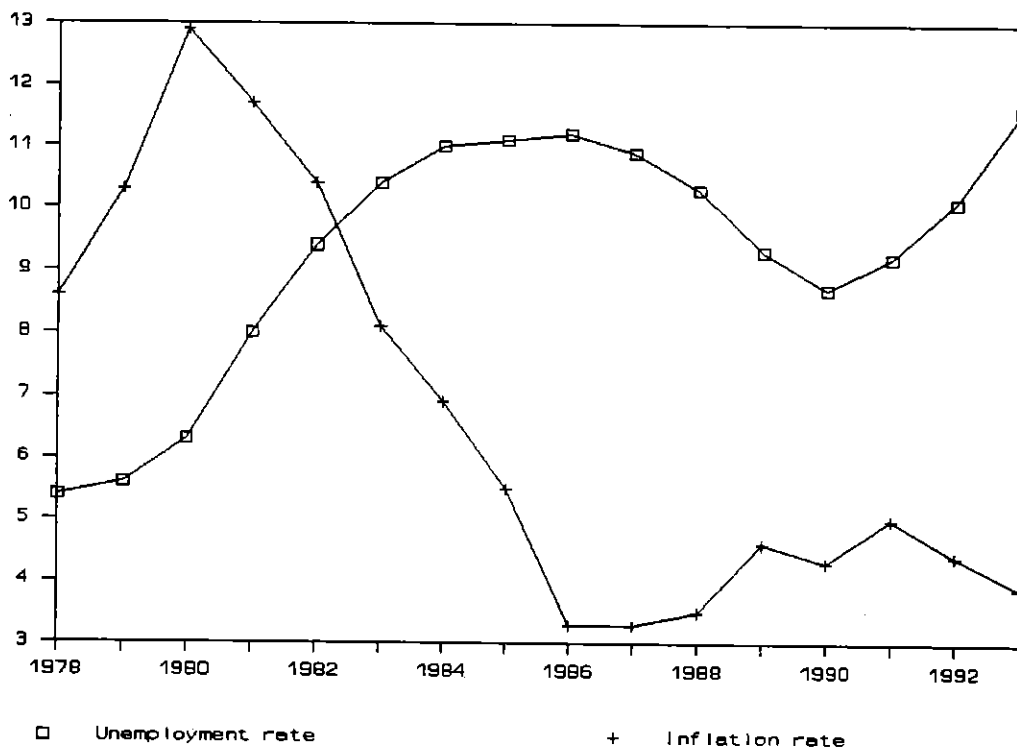Figure 1. *Unemployment and inflation rates in the OECD (1978-93)*

| □ Unemployment rate | + Inflation rate |

Figure 2. *Unemployment and inflation rates in the EC (1978-93)*

| □ Unemployment rate | + Inflation rate |

Note: The data concern standardized unemployment and percentage growth of the private consumption deflator (1993: projection). Source: OECD, *Economic Outlook*, June 1993.

describe the main characteristics of wage bargaining and price-setting. Equation (3) determines employment. All variables in these equations, except u, are expressed in logs.

$$w = a_0 + p^e - a_2 u + a_3 q^* + a_4 z \qquad (1)$$

$$p = w - q^* + \beta_0 \qquad (2)$$

$$n = \delta_0 - \delta_1 (w - p) + \delta_2 y + k \qquad (3)$$

with : w : nominal wage level
      p : price level
      p^e : expected price level
      u : unemployment rate
      q^*: trend productivity
      z : other relevant factors
      n : employment level
      y : real demand (income)
      k : capital stock
      $a_i, \beta_0, \delta_i \geq 0$

Wages are bargained as a mark-up on expected prices, with the mark-up depending on the state of the labour market, trend productivity and a number of other relevant elements, called z (equation 1). The most popular among the latter elements are mismatch, oil prices, the degree of unionization, the tax wedge, the level of unemployment benefits, etc. (see e.g. Layard and Nickell, 1986; and Nickell, 1989).

The higher the rate of unemployment, the lower the mark-up wage-setters will, ceteris paribus, try to obtain. The parameter a_2 reflects the responsiveness of wages to unemployment. Several reasons explain this negative relation between unemployment and the wage-price mark-up. First, facing worse labour market conditions, workers (unions) will moderate their wage claims. The growing number of job searchers on the labour market will increase the employed's expected welfare loss in the event of a layoff. Their preference for wages, relative to employment, will fall. Second, if unemployment rises, the employer's wage offer to his current employees can be expected to decline since the number of 'employable' workers at his disposal rises. Third, rising unemployment undermines the workers' bargaining power.

If productivity (q^*) rises, bargained real wages will also rise. The parameter a_3 indicates to what extent productivity gains are absorbed into higher wages.

Firms are assumed to set their prices as a fixed mark-up on wages (equation 2). Reviewing the literature, Carlin & Soskice (1990, chapters 6 and 18), Bean (1989) and Layard, Nickell & Jackman (1991, chapter 7) argue this is generally found

to be the case, except maybe in situations of very high rates of capacity utilization which may induce firms to push up their price-wage mark-ups. Specifically, equation (2) reflects the case of normal cost pricing: prices are set as a fixed mark-up on normal unit labour costs (i.e. wages adjusted for trend productivity, w-q*).

In equation (3) employment depends negatively on the real wage and positively on the capital stock and aggregate demand. Assuming Cobb-Douglas technology and constant returns to scale, the coefficient on the capital stock equals one. The reason for the positive aggregate demand effect is intuitively straightforward. Since imperfectly competitive firms produce where the marginal product of labour exceeds the real wage, it will always be profitable to increase output and employment in response to a demand rise in the product market (for given real wage)[3].

Figure 3 presents these equations graphically (panel a) and shows how inflation and the Phillips curve can be derived from them (panel b). (This figure concerns a macroeconomic outcome). The employment equation is presented in terms of the unemployment line (UL). Labour supply is assumed fixed. At the intersection of the wage line (WL) and the price line (PL), the equilibrium rate of unemployment (u*) reconciles the real wage claims of wage-setters and the real wage that price-setters concede by means of their pricing policy. Actual inflation will then be constant and equal to expectations. The equilibrium rate of unemployment can therefore best be characterized as the non-accelerating inflation rate of unemployment (NAIRU).

Substituting equation (2) into (1) and putting $p^e = p$, we can derive in equation (4) that the NAIRU is determined by the mark-ups α_0 and β_0 that wage and price-setters aim to obtain, by q* and by the factors behind z. The most popular among the latter factors are mismatch, oil prices, the degree of unionization, the tax wedge, unemployment benefits, etc. (see e.g. Layard & Nickell, 1986, and Nickell, 1989).

$$u^* = (\alpha_0 + \beta_0 - (1-\alpha_3)q^* + \alpha_4 z)/\alpha_2 \qquad (4)$$

2.2. Explanation of inflation

If actual unemployment deviates from the NAIRU, the two sets of claims on real income will become inconsistent, a 'battle of the mark-ups' will arise and inflation will change. Point a in figure 3 presents equilibrium (assuming q* to be constant):

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[3] More formally, this result follows from the fact that firms find it profitable to maintain a fixed mark-up of prices on wages (equation 2) and thus, under the standard assumption of declining marginal product, to reduce their mark-up of prices on marginal cost when demand rises (e.g. to attract new customers or impede new entry).

$u = u^*$, $w-p = (w-p)_1$ and $\mathring{p}^e = \mathring{p} = \mathring{w} = \mathring{p}_1$. Suppose the government then expands real demand from its natural level ($y_1 = y^*$) to y_2. The unemployment line will shift to the left and (for a given real wage) unemployment falls to u_2 (point b). A gap of, say, x% is opened between the wage-setters' wage claim $(w-p)_2$ and the price-setters' wage concession $(w-p)_1$. At the next bargaining round wage-setters will increase nominal wage growth above expected inflation to $\mathring{w} = \mathring{w}_2 = \mathring{p}^e + x = \mathring{p}^e - a_2(u_2 - u^*)$. Observing the reduction of their profit margin, price-setters, whom we assume to determine prices after wages have been bargained, will however respond by increasing price inflation to $\mathring{p}_2 = \mathring{w}_2$ and restore the real wage level $(w-p)_1$. In panel (b) the typical augmented Phillips curve effect shows up: $\mathring{p} > \mathring{p}^e$ when $u < u^*$.

Figure 3. *The competing claims model of wage and price-setting and the derivation of the Phillips curve*
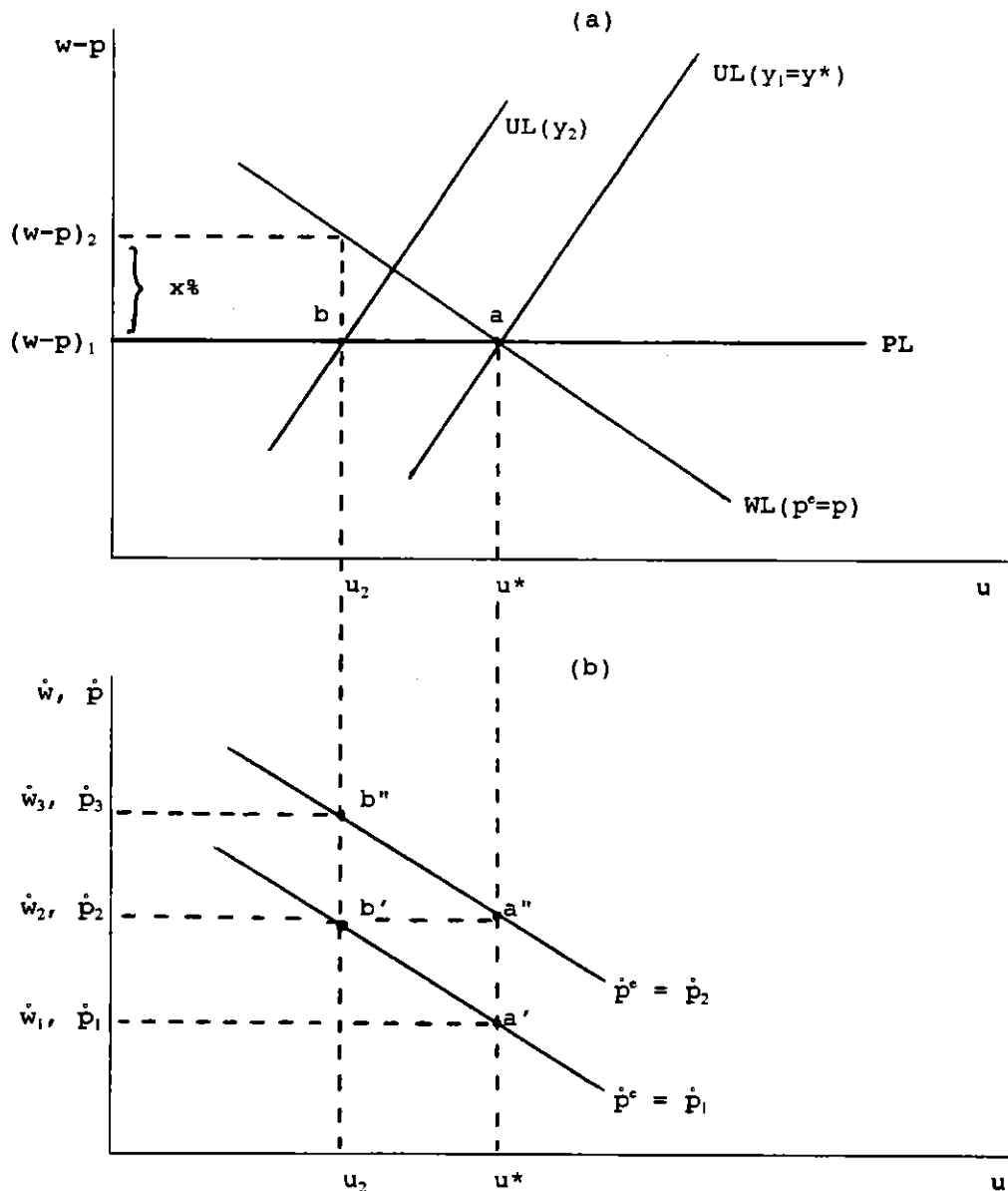
The evolution of the economy in later periods depends on the mechanism according to which wage-setters form their price expectations and the stance of government policy. Let us assume that expected inflation equals lagged inflation and that the government maintains real demand at y_2. The Phillips curve then shifts upward $(\mathring{p}^e = \mathring{p}_2)$, unemployment remains at u_2 and the battle of the mark-ups continues. Inflation accelerates to $\mathring{p}_3 = \mathring{w}_3 = \mathring{p}_2 + x = \mathring{p}_2 - a_2(u_2 - u^*)$. In the end the government will have to return to a less expansionary policy stance (y_1) and unemployment will rise again to u^*, reconciling income claims of wage and price-setters.

The case of demand restriction is completely analogous. It pushes unemployment upwards and reduces the wage-setters' real wage ambitions. They accept nominal wage slowdown, which will further result in lower price inflation. For given nominal demand growth, falling inflation stimulates real demand and unemployment will return to u^*. Inflation will then stop declining.

Equation (5) presents the Phillips curve algebraically. The parameter a_2 determines the slope of the Phillips curve, whereas $\mathring{p}^e$ and u^* generate shifts of this curve.

$$\mathring{p} = \mathring{w} = \mathring{p}^e - a_2(u - u^*) \tag{5}$$

2.3. Extension of the model: unemployment persistence and hysteresis

As we have argued in the introduction, the stabilization of inflation in the mid-1980s (despite continuously high unemployment) is mainly due to a rise in u^*. In terms of figure 3 (panel a), a rising NAIRU results from either an upward shift of the wage line or a downward shift of the price line. As we have also argued, explanations of this rise on the basis of the factors z in equation (4) proved unsatisfactory. A more successful explanation seemed to be provided by the use of the notion of *unemployment persistence* or *hysteresis*.

Unemployment persistence points to mechanisms in the economy which imply that the NAIRU depends on the time-path of previous actual unemployment. As a consequence, if demand restraint pushes unemployment upwards, its unfavourable effects will be propagated over long periods of time because the NAIRU will also rise. Algebraically, unemployment persistence imposes a modification of equation (4). In most general terms, this can be rewritten as

$$u^* = c_0 - c_1 q^* + c_2 z + \pi u_{-1} \tag{4'}$$

with: π: unemployment persistence parameter $(0 \le \pi \le 1)$ and $c_i = c_i(a_i, \beta_i)$.

The value taken by π determines whether rising unemployment has a long-run or only medium-run effect on the NAIRU (see e.g. Wyplosz, 1987; Franz, 1990; Katzner, 1993). If π equals 1, there is a long-run effect. This is the pure or full *hysteresis* case with an unstable long-run NAIRU. If $\pi < 1$, the long-run NAIRU is stable. This is the case of *persistence*.

Unemployment persistence (or hysteresis) also affects the Phillips curve (5). Substituting equation (4') into (5) generates

$$\overset{\circ}{p} = \overset{\circ}{p}{}^e - a_2(u - \pi u_{-1}) + v \tag{5'}$$

with : $v = a_2(c_0 - c_1 q^* + c_2 z)$

In the case of pure hysteresis only a change in unemployment affects inflation. The level of unemployment is irrelevant. In the case of persistence both the change and the level exert an effect.

In the literature at least three different channels are examined through which a rise in actual unemployment may bring about a rise in the NAIRU. We study the relevance of these in the next three sections. We will then also provide a firmer underpinning of the extension of equations (4) and (5).

3. Capital scrapping and the rising NAIRU in the 1980s

A first route to unemployment persistence/hysteresis investigates the negative effects of depressed demand on investment and capital accumulation, induced by a reduction of capacity utilization. Figure 4, representing the wage, price and unemployment lines introduced in figure 3, illustrates the extremest version of this mechanism and its consequences.

Initially, the macroeconomy is in point a, with real demand at y_1 and the capital stock at k_1. The original equilibrium level of unemployment or NAIRU is u^*_1. In its fight against inflation the government then reduces demand and maintains it at a real level y_2. The economy moves to point b, with higher unemployment, falling inflation (see figure 3(b)) and lower capacity utilization. To the extent that this situation persists, with part of the capital stock remaining idle, firms will respond by reducing investment. The capital stock declines to k_2. If ultimately the government relaxes its tight demand management policy and y returns to y_1, the economy may very well end up in point c, facing a permantly higher NAIRU (u^*_2), higher wage inflation than would otherwise be observed and lower real wages. Notice that, to keep our figure simple, we have assumed that the negative effect of the falling capital stock on labour demand equals the negative initial effect of falling demand.

The unemployment line $UL(y_2, k_1)$ then coincides with $UL(y_1, k_2)$.

Figure 4. *Persistent unemployment and the capital shortage hypothesis*
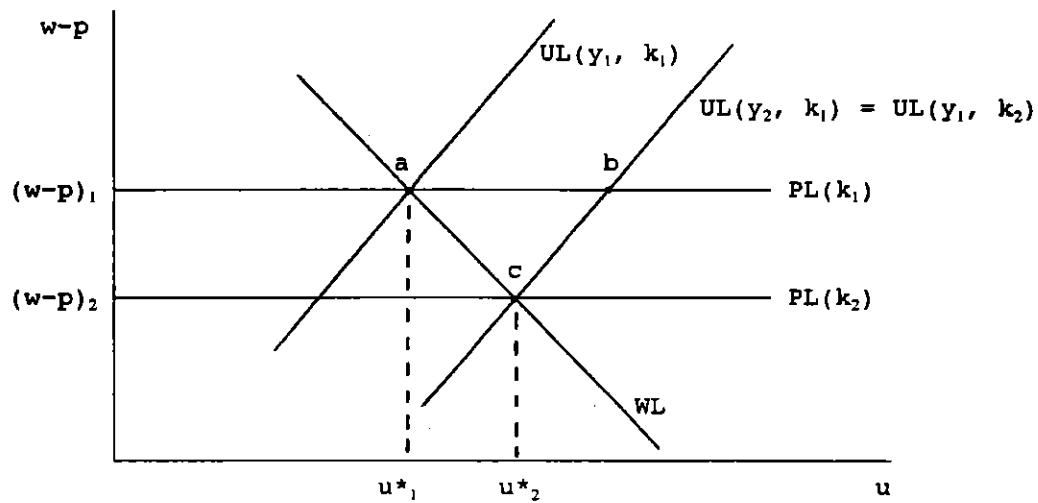
The main element underlying this unfavourable evolution is the downward shift of the price line. A lower capital stock reduces productivity (q*), for given unemployment, and thus the amount of real income to distribute. The price line shifts downwards to the extent that firms shift the burden of adjustment to the workers. Further, given the lower capital stock, the return of real demand to its original level generates very high rates of capacity utilization. Assuming that competitors also face capacity constraints, firms may exploit this situation by pushing up profit margins, which further reduces the real wage they are conceding to workers. In order to make the workers' income claims consistent to those of the firms, a higher unemployment rate becomes unavoidable.

It should be noticed that figure 4 reflects the assumption that workers are unwilling to absorb the fall of productivity into lower real wages (for given unemployment). The wage line does not shift downwards. In terms of equation (1) this means that $a_3 = 0$ for falling productivity.

If we turn to the empirical relevance of this explanation, we notice that at first sight it fits the facts in the 1980s fairly well. Modigliani et al. (1987), Burda (1988a) and Bean (1989) present evidence confirming the predictions on the evolution of investment and the capital stock and on the relation between unemployment and capacity utilization. They show that in most countries the first years of the 1980s were characterized by rising unemployment and falling capacity utilization. Investment started to decline and a capital gap (i.e. a gap between the actual and the trend or full employment capital stock) could be seen to develop from 1981 onwards. In later years capacity utilization returned to record levels. Unemployment, however, did not decline.

Despite these supportive findings, Modigliani et al. (1987) and Bean (1989) reject the hypothesis that the persistently high rates of unemployment in some European countries are mainly due to capital shortage. So do Blanchard & Summers (1986) and Gordon (1988), who extrapolate pre-second world war U.S. experience. Of the various reasons that are put forward, the main is that capacity is not fixed, but responds positively to rising utilization rates and profitability when demand regains its earlier strength. The unemployment line will thus almost automatically return to $UL(y_1, k_1)$.

Another problem for the capital shortage hypothesis is that it requires the assumption that the wage line remains fixed ($a_3 = 0$). It can, however, be expected that in the long-run wage-setters adjust their wage aspirations to the rate of capital accumulation (Bean, 1989). The fact that the unemployment rate and capital intensity are unrelated in the long-run confirms this expectation.

4. Insider wage-setting, membership considerations and hysteresis

The fact that capacity shortages take care of themselves does not yet imply that the economy in figure 4 will return to u^*_1. Both Modigliani et al. (1987, p. 24-25) and Bean (1989, p. 41) are aware that labour market distorsions may impede this return by eliciting increased wage inflation when demand regains its earlier strength (y_1). One of these distorsions is the *insider-outsider problem*.

This problem is discussed mainly by Blanchard & Summers (1986; 1987) and Lindbeck & Snower (1986; 1987b; 1988a). Their insider-outsider models identify two groups of workers. Insiders are experienced incumbent employees whose positions are protected by labour turnover costs, i.e. costs that the firm must bear if it fires an insider and hires someone else, an outsider, to replace the insider. The outsiders are the unemployed and those working in the informal sector, with little job and income security. Lindbeck & Snower (1986) distinguish various kinds of labour turnover costs. To name the most important, firing an insider may imply that the firm incurs severance pay, runs the risk of strikes and creates low morale in the remaining workforce. Hiring an outsider generates e.g. advertising, screening and training costs. Further, the firm faces the problem that the remaining insiders may refuse to cooperate with new workers, who replace their former colleagues.

As a consequence of these labour turnover costs, the insiders are provided with a strong bargaining position and a major influence on the wage, making underbidding by outsiders impossible. To some extent, this observation may justify the fact that in most insider-outsider models, like in the monopoly union model, the

insiders are assumed to fix the wage unilaterally[4]. They do this with the objective of improving their own situation and attach virtually no importance to the creation of employment for the outsiders. A typical result in these models is that the wage is always chosen so that expected employment equals the number of insiders, plus a constant (see Blanchard & Summers, 1986, for a formal derivation)[5]. Membership rules deciding who has insider status then become the main determinants of equilibrium (un)employment. Unemployed workers who have lost insider status no longer exert downward pressure on the wage. They constitute u^*.

Figure 5 presents the effects of monopolistic insider wage-setting graphically[6]. Underlying this figure is the most extreme assumption that membership or insider status depends on employment in the previous period. The number of insiders (n^i) therefore equals n_{-1} and $u^* = u_{-1}$. Further, it is assumed that in case employment falls short of n^i, all insiders face the same layoff probability. These assumptions and the result derived in formal models that wages are set so that expected employment equals the number of insiders, imply graphically that the wage line is vertical at u^*.

Initially, the economy is again in point a and the government reduces demand to y_2. If the insiders anticipate this demand reduction, they will moderate their nominal wage in order to obtain a real wage $(w-p)_3$ (point g) and to keep expected employment equal to its initial level (n^i_1, which corresponds to u^*_1). The response of the firms, restoring the initial real wage level, will, however, take the economy to point b, with some of the insiders laid off. If demand reduction was not expected, the economy would also move to b, but there would be no reduction of wage and price inflation. Because the laid off insiders immediately become outsiders, their interests will no longer be taken care of in the next period. The wage line shifts to u^*_2, corresponding to the reduced number of insiders (n^i_2). This has the important implication that, assuming the government maintains demand at the low level y_2, the higher level of unemployment persists without any further downward pressure on inflation.

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[4] In the monopoly union model the workers (union) are assumed to fix the wage unilaterally, whereas the employer is free to determine employment. This is the case in Blanchard & Summers (1986; 1987), Lindbeck & Snower (1988a), Gottfries & Horn (1987) and Alogoskoufis & Manning (1988). On the other hand, Lindbeck & Snower (1987b) and Nickell (1989) present a "right to manage" model. In this approach wages are determined by bargaining between the union and the employer, whereas employment is unilaterally fixed by the employer. Solow (1985) discusses both types of models. Not unexpectedly, the outcome of the "right to manage" model is more favourable to the employment of outsiders. The larger the bargaining power of the employer, the better the situation is for outsiders.

[5] This constant may be zero. If it is positive, it implies that, on average, some outsiders are hired. They are hired, however, only to decrease the insiders' risk of being laid off. In what follows, we neglect this constant.

[6] Figure 5, as well as figure 6 presented in the next section, are to a large extent based on Carlin & Soskice (1990, chapter 19). Notice that in figure 5 we temporarily drop the idea of wage *bargaining*, which underlies our model in sectin 2.

Figure 5. *Insider wage-setting and unemployment persistence*
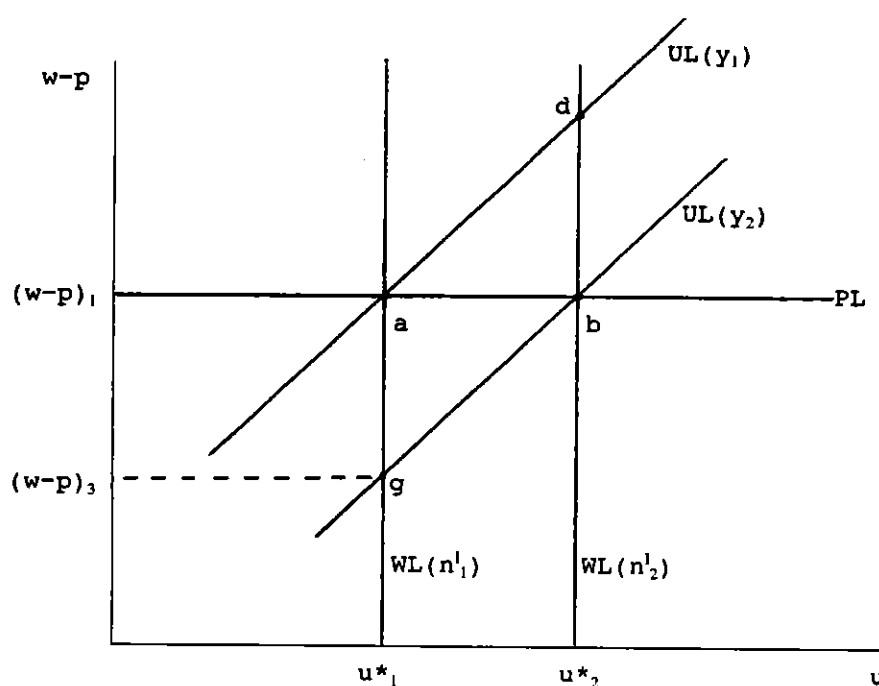
The difference between anticipated and unanticipated shocks is important. If the government reduces real demand to y_2 by decreasing nominal demand growth and if this is anticipated, so that wage and price-setters will respond by reducing inflation, real demand may remain unaffected at the y_1 level. The economy would then remain in point a, with the same NAIRU, but a lower level of inflation. We notice that in this respect our assumption of identical layoff probability for all insiders is of crucial importance. If the insiders face different layoff probabilities (e.g. seniority rules), it makes no difference whether shocks are anticipated or not. If the median insider is certain to keep his job, the credible announcement of a policy of nominal demand reduction will not generate a slowdown of money wages and prices[7]. The economy would then in any case move to point b.

Let us suppose that the economy did indeed end up in point b in the beginning of the 1980s. (Given the unexpected nature of the oil price shock and the severeness of the policy of demand restraint, this is certainly an acceptable starting point.) Can figure 5 then explain further economic developments in the 1980s? To some extent,

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[7] The wage line is then vertical for real wage levels above $(w-p)_1$, but becomes horizontal at $(w-p)_1$. The anticipation of higher demand results in higher wages, whereas the anticipation of lower demand generates higher unemployment (see also Lindbeck & Snower, 1988a).

it can. It predicts stabilization of inflation at high levels of unemployment. It has, however, difficulties explaining unemployment persistence. Figure 5 implies that as soon as demand returns to y_1 the economy will return to point a. If higher demand is anticipated, wage-setters see their job prospects improved and claim a higher real wage (point d). Wage inflation rises. The price-setting behaviour of firms, however, will maintain the real wage at $(w-p)_1$. Employment and the number of insiders will rise, whereas the NAIRU will fall back to u^*_1. In case the rise in demand to y_1 is unanticipated this result would follow without a rise in inflation. Consequently, if we want to explain unemployment persistence, the model underlying figure 5 must be modified.

One possible modification concerns the firm's price-setting behaviour. For example, Lindbeck & Snower (1987b) consider the price level exogenous. Under the assumption of price-takership, the firm can no longer determine the real wage. In that case, there is no price line. An alternative modification in this respect is to assume price-setting firms that maintain a fixed mark-up of prices on marginal costs. In that case, the price line coincides with the labour demand curve and thus, in terms of our figures, the unemployment line. This kind of price-setting behaviour implies, however, that aggregate demand policy has no immediate influence on the labour demand curve. Disinflationary policy by the government would then leave the unemployment line unaffected. This is the option taken by Lindbeck & Snower (1988a). Explaining persistently high unemployment in the 1980s then requires to rely on unfavourable supply shocks or on indirect transmission mechanisms from demand management policy to labour demand. Lindbeck & Snower (1987a; 1988a) present such mechanisms (e.g. demand management policy may influence the number of firms or the marginal product of labour).

The two modifications of pricing behaviour presented above imply that equilibrium in the economy is obtained at the point of intersection of the wage and the unemployment line. A return to point a and u^*_1 would then only follow if the return of demand to y_1 is unanticipated. If anticipated, point d would be obtained.

Though these modifications can explain unemployment persistence if shocks are anticipated, they cannot if shocks are unanticipated. Another major problem is that neither price-takership, nor price-setting on the basis of a fixed mark-up on marginal costs fit the empirical findings, which suggest a fixed price-wage mark-up (see section 2). An alternative modification which seems more promising, has been suggested by Blanchard & Summers (1986; 1987) and is also inherent in Lindbeck & Snower's (1987b) entry-exit function. The link between membership and employment is probably not as tight as we assumed before. It may for example take s periods, say years, to acquire or lose insider status. As a consequence, it takes a longer sequence of s similar shocks to change membership and u^*. In this interpretation, the

unfavourable oil price shock, followed by several years of restrictive demand policy may have taken the economy and u^* to point b. The return to a is, however, much more difficult and unrealistic than in figure 5. It requires a sequence of s either unanticipated or (probably government induced) anticipated favourable shocks. The former seems rather unlikely and the latter generates accelerating inflation since unemployment is deliberately kept below u^*_2 for s years. Wage-setters realize this and will try to exploit it. The government would soon have to change its policy, leaving the NAIRU at u^*_2. Allowing for asymmetric membership rules would make the return to point a even more difficult. If it takes more time to gain insider status than to lose it, unexpected adverse shocks have stronger persistence effects than unexpected positive shocks.

Though this modified model goes a longer way explaining developments in the 1980s, further points of criticism can be raised[8]. To mention one, the model as it has been presented is a model of extreme insider power with pure hysteresis. Employers and outsiders have no role to play. The implication is that there is no stable long-run NAIRU to which unemployment tends to return eventually (i.e. unemployment would not be untrended in the long-run). Empirical observation rejects this implication (Layard & Bean, 1989) and suggests that additional to conditions inside the firm, the wage also reflects outside conditions. Various authors present evidence of this. Some even present evidence that, in comparison, the influence of inside labour market conditions and membership effects on the wage may be much weaker than the influence of outside conditions (see Flanagan, 1988, who examines aggregate wage determination in seven countries; Holmlund & Zetterberg, 1991, who study wage determination at the level of the industries in five countries; Nickell & Wadhwani, 1990, and Blanchflower et al., 1990, who explain wages at the level of the firm in the U.K.; and Nickell, 1988, also for the U.K.). These studies certainly suggest that an explanation of wage formation and inflation in the 1980s cannot be satisfactory without including and explaining outside labour market developments. So do a lot of other studies to which we shall refer below[9].

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[8] These points of criticism do not concern the work of Blanchard & Summers, neither of Lindbeck & Snower. They are due to the fact that we limited ourselves to representing and interpreting their basic models.

[9] To some extent, the results presented by Coe (1989) on wage formation at the level of the industry in 14 OECD countries do not fit this pattern. For a majority of industries in the specific countries Coe rejects the hypothesis that aggregate (outside) labour market conditions, i.e. the aggregate unemployment rate, exert a significant influence on wages. The only aggregate variable that has a significant influence on the wage, he argues, is the consumer price level. Considering the innumerable number of studies (for a limited survey, see e.g. Andersen, 1989) that do find significant unemployment effects on wages, although most of them at the aggregate level, Coe's conclusions remain rather uncommon.

5. Outsider ineffectiveness, duration effects, long-term unemployment and hysteresis

The role of external labour market conditions can be introduced in various ways (see Blanchard & Summers, 1987; Lindbeck & Snower, 1988b, chapter 11; Van Rompuy, 1987). Allowing longer transition times between insider and outsider status, like we did at the end of the previous section, is a first step. It allows some of the unemployed to influence wage formation. These, however, are not yet outsiders. Second, external labour market conditions may affect insider wages since they influence the insiders' chances of finding a new job in case of dismissal. Higher unemployment, which means lower re-employment probabilities, should make the insiders accept a lower wage. A third link between inside and outside conditions is established to the extent that unemployment benefits for the outsiders are financed by taxes on the insiders and thus affect the latters' net wages. Fourth, insiders have an incentive to encourage the hiring of outsiders to the extent that their bargaining power depends on the size of their membership. Last but not least, dropping the assumption that wages are unilaterally fixed by the insiders, external conditions will be reflected by employer influence in bargaining. In a slack labour market with poor business prospects and many outsiders knocking on the door, the firm's wage offer will also be poor. The 'employability' or 'effectiveness' of those outsiders then becomes of major importance.

The role of outsider effectiveness and its influence on wage formation and the NAIRU has received major attention from Layard & Nickell (1986), Franz (1987), Layard & Bean (1989), Nickell (1988) and Layard, Nickell & Jackman (1991). Interesting work in this respect has also been done by Muysken & de Regt (1990). In these authors' view three mechanisms make an adverse shock have persistent effects. Figure 6 represents the implications of these mechanisms graphically. Box 1 provides an algebraic approach. First, since an adverse shock reduces employment and the outflow from unemployment, it implies that a larger number of unemployed experience long spells without work. Rising unemployment thus appears to be associated with rising duration of unemployment. In the long-run this mechanism establishes a positive relation between the rate of unemployment and the proportion or share (sltu) of long-term in total unemployment (figure 6(a)). Sinclair (1987, chapter 13) mentions somewhat more specific explanations of this relation. For example, rising unemployment softens the stigma attached to being out of work and makes the situation of the individual unemployed less uncomfortable. ("Society is kinder to conformists"). Further, it reduces the probability of successful search, simply because there are more applicants for jobs. As a consequence, people's incentives to spend time finding a job may vary negatively with the overall unemployment rate and duration may rise.

<u>Second</u>, the employability and search intensity of an unemployed worker falls with the duration of his spell of unemployment (negative duration dependence). Long-term unemployment therefore reduces effective labour supply. Hargreaves Heap (1980), Budd et al. (1987), Franz (1987), Price (1988), Nickell (1988), Tötsch (1988) and Bourdet & Persson (1991), among others, put forward various explanations. For example, prolonged unemployment depreciates the skills (human capital) of the worker. It also generates a loosening of attachment to the labour force since the long-term unemployed simply get out of the habit and discipline of working. Further, the longer the period of unemployment, the lower the unemployed may perceive their chances ever to be re-employed. They may become discouraged (or discriminated by clerks in the employment office), which further lowers the re-employment probability. Finally, employers may consider a prolonged unemployment spell as a negative signal of a worker's expected productivity.

For completeness, it should be mentioned that sorting theory rejects the idea of negative duration dependence (see Bourdet & Persson, 1991). It is argued that longer unemployment duration does not *by itself* explain lower re-employment probabilities. On the contrary, both prolonged unemployment and low re-employment probabilities are considered to be the results of a third factor at work (e.g. lack of motivation, health problems). The fact that this third factor is difficult to observe (unobserved heterogeneity), is one of the main problems that empirical work, testing for negative duration dependence, has to face. The reason is obvious. In an arbitrary group of unemployed workers, it will always be the healthier and motivated who find a job first. The remaining group of unemployed will gradually consist of less healthy and less motivated people, with low re-employment probabilities. Consequently, if 'unobserved heterogeneity' is not controlled for, the conclusion that longer unemployment spells lead to lower exit rates follows automatically, even if there is no negative duration dependence at the individual level.

<u>Third</u>, reduced employability or effectiveness of the unemployed outsiders increases both the re-employment probability of the insiders in case of dismissal and their bargaining power. This is due to the fact that rising long-term unemployment implies that the pool of workers considered serious candidates for jobs, becomes smaller. Exploiting their more comfortable position, the insiders will push for higher wages. Moreover, the smaller pool of employable workers will increase the firm's willingness to pay higher wages. Graphically, the second and third mechanism imply that a rise of the sltu pushes the (short-run) wage line WL_s upwards (see figure 6(b)).

On the basis of the relation between unemployment and the share of long-term unemployment in figure 6(a) and the (short-run) wage lines in 6(b), one can derive the long-run wage line WL_L. This line represents the relation between the state of the

labour market and the bargained real wage in the long-run[10]. It is flatter than the short-run wage line, which means that the impact of rising unemployment on the bargained wage claim in the long-run is smaller than the impact in the short-run. The reason is to be found in the additional wage pressure generated by the rising sltu that goes along with rising actual unemployment. Finally, we emphasize that the concept of a long-run wage line is important since it implies the existence of a stable long-run NAIRU at its intersection with the price line.

Figure 6(c) tries to explain economic developments in the 1980s along the lines set out in this section. Initially, in point a, unemployment equals the long-run NAIRU $(\bar{u}^*)$. This also equals the short-run NAIRU u^*_1, corresponding to $WL_s(sltu_1)$. Restrictive policy by the government brings the economy to point b, with unemployment rising to u_2. This will temporarily result in falling inflation since a gap is opened between the bargained real wage (WL) and the real wage determined by the firms' pricing policy (PL). If restrictive government policy is maintained for some time, however, unemployment duration and the share of long-term unemployment will rise to $sltu_2$, corresponding to u_2. The short-run wage line will shift upwards to $WL_s(sltu_2)$, narrowing the gap between bargained wage claims and price determined wage concessions. The short-run NAIRU rises to u^*_2 and disinflation decelerates. (We notice that the slope of the long-run wage line is of crucial importance in this respect).

This is not a long-run equilibrium, however. To the extent that falling inflation enhances real demand (i.e. for unchanged nominal demand growth) and induces the government to relax its demand policy, the unemployment line will shift to the left. As figure 6(c) shows, and reality proved, a good deal of caution is required in this respect. If real demand growth is too fast (i.e. $y > y_3$), unemployment will be driven below the short-run NAIRU (u^*_2) and inflation will again accelerate. The important point is to "wait" for the recovery and the lower rates of unemployment to be reflected in a lower share of long-term unemployment, increased outsider effectiveness and a downward shift of the short-run wage line. This shift makes further demand expansion possible and an ultimate return to $\bar{u}^*$.

Though not many high unemployment countries seem to have fully realized the return to $\bar{u}^*$, we believe the explanation of developments in the 1980s along the lines set out above, is a relatively strong one (which may show up again now in the 1990s). It is supported by <u>empirical evidence</u> on all three mechanisms mentioned above (though this evidence often concentrates on a limited number of countries).

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[10] To every rate of unemployment corresponds an equilibrium share of long-term unemployment and thus an equilibrium short-run wage line. Combining the real wage level indicated by this short-run wage line with the underlying unemployment rate, gives a point of the long-run wage line. In our figures the long-run wage line has a negative slope. This need not be so (see box 1).

Figure 6. *Outsider ineffectiveness, long-term unemployment and persistence*
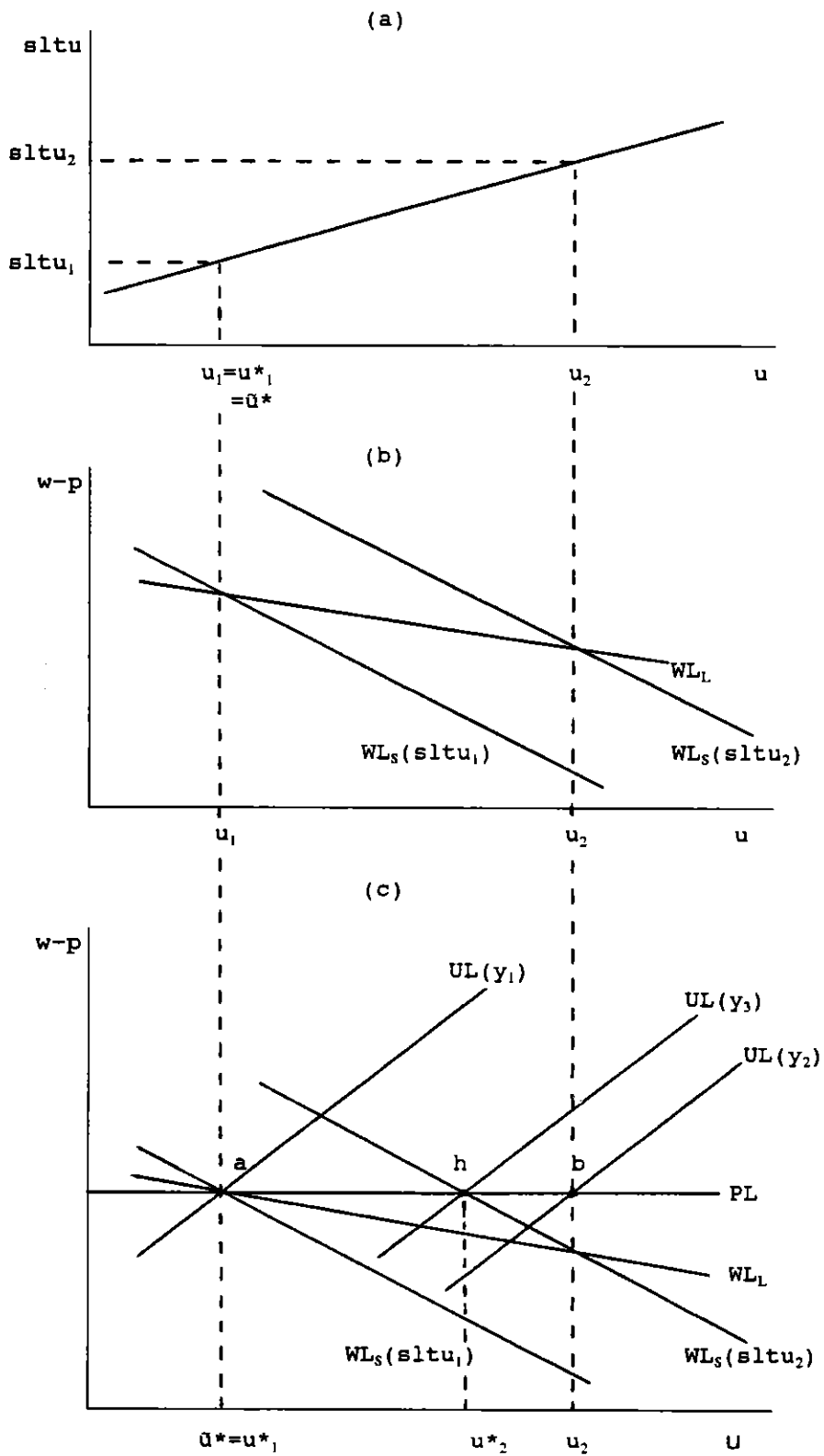
Box 1. Long-term unemployment, wage formation and the NAIRU: An algebraic
approach

An algebraic treatment of the impact of outsider ineffectiveness, duration dependence
and long-term unemployment necessitates an extension of our model (equations 1-3). It
allows us to underpin the impact of lagged unemployment in equations (4') and (5').

Equation (6) reflects the positive association between the level of unemployment in the
economy and its duration, represented by the share of long-term unemployment (sltu).
This relation typically concerns the long-run. In the short-run it has been found not to
hold. Equation (7) may then be a more adequate representation. Rising unemployment
and, thus, an increased inflow of short-term unemployed people reduces sltu.

$$sltu = s_0 + s_2 u \tag{6}$$

$$sltu = s_0 - s_1 \Delta u + s_2 u_{-1} \tag{7}$$

Equation (1') is the augmented short-run wage equation. It allows for the impact of
long-term unemployment on outsider effectiveness and employability, and for the
impact of the latter on the process of wage formation. The magnitude of a_5 determines
to what extent wage claims are pushed upwards if sltu rises. For simplicity, it is
assumed that nothing changes as far as a_0, z, etc. are concerned. The long-run wage
equation (8) can be derived by substituting equation (6) into the short-run wage
equation (1') and putting $p^e = p$. Underlying the negative slope of WL_L in figure 6 is the
assumption that $a_2 > a_5 s_2$. As Nickell (1988) made clear, however, the long-run wage
line need not always have a negative slope. More complex short-run wage equations
and more complex relations between u, u_{-1} and sltu than our equations (1'), (6) and (7)
may for example generate a U-shaped long-run wage line.

$$w - p^e = a_0 - a_2 u + a_3 q^* + a_4 z + a_5 sltu \tag{1'}$$

$$w - p = a_0 + a_5 s_0 - (a_2 - a_5 s_2)u + a_3 q^* + a_4 z \tag{8}$$

with : $s_i, a_i \geq 0$

Substituting the price equation (2) and equation (7) into (1'), and putting $p^e = p$, one can
calculate the short-run NAIRU (u*, equation 9). This is found to depend on lagged
unemployment. The long-run NAIRU (ū*) follows from substituting (2) into (8) (equation
10).

$$u^* = \frac{1}{a_2 + a_5 s_1} [a_0 + a_5 s_0 + \beta_0 - (1-a_3)q^* + a_4 z + a_5(s_1 + s_2)u_{-1}] \tag{9}$$

$$ū^* = [a_0 + a_5 s_0 + \beta_0 - (1-a_3)q^* + a_4 z]/(a_2 - a_5 s_2) \tag{10}$$

As can also be seen algebraically, a unique and positive long-run NAIRU requires the
long-run wage line to have a negative slope (i.e. $a_2 > a_5 s_2$).

First, the positive long-run relation between unemployment and the share of long-term unemployment can not only be observed in the 1980s, it can also be found econometrically over longer periods of time for various countries (see OECD, 1983, p. 95-100; Layard & Nickell, 1986; Nickell, 1988; Franz, 1987; Muysken & de Regt, 1990).

Second, evidence on the reduced employability and search effectiveness of the long-term unemployed has been derived from both micro and macroeconomic data. *Microeconomically*, Layard & Nickell (1986, p. 154), Layard, Nickell & Jackman (1991, p. 236-238) and Wadsworth (1991) mention as result for the U.K. that the long-term unemployed are less active/effective in seeking work: they spend less time and, especially, less money searching for a job. Further, they have less contact with employers. Devine & Kiefer (1991, p. 213) support these findings for the U.S., concluding that "there is some evidence that search intensity declines with the duration of an unemployment spell". De Witte (1992) obtains similar results for Belgium. He emphasizes that many unemployed stop actively searching for work after a certain unemployment duration. Underlying this 'withdrawal' from the labour market is pessimism about their chances ever to find a job again. Dawson (1992, p. 89-92) also pays attention to the effects of unemployment on mental health. Reviewing some longitudinal studies for the U.K., he concludes that "people visibly deteriorate across time".

Further, several authors have estimated so-called hazard fuctions, for various countries and periods (for surveys, see Devine & Kiefer, 1991, chapters 2 and 6; and Pedersen & Westergård-Nielsen, 1993). These hazard functions relate an unemployed person's re-employment probability to the duration of his current spell of unemployment, controlling for e.g. age, education, nationality, previous employment experience and aggregate or local labour market developments. As we have mentioned earlier, only empirical analyses with measures to correct for unobserved heterogeneity are reliable. As far as the results of these analyses are concerned, consensus has however not yet been reached. Some authors support the idea that a person's chance to escape from unemployment decreases with the length of his unemployment period. Others reject it. To some extent this ambiguity is undoubtedly due to the fact that accurately estimating hazard functions is "a very tricky business" (Layard *et al.*, 1991, p. 256). On the other hand, it should be noticed that this ambiguity does not invalidate the main point we want to make, namely that increasing unemployment duration reduces a worker's chances on the labour market (the amount of job offers he receives) *for a given wage* (see also Winter-Ebmer, 1991). The empirical observation that his re-employment probability may not fall with rising unemployment duration is also due to a counteracting force at work: increasing unemployment duration reduces a worker's reservation wage (see the evidence

surveyed by Devine and Kiefer, 1991, chapter 4; and Pedersen and Westergård-Nielsen, 1993).

As for related *macroeconomic work*, the reduced employability and search intensity of the long-term unemployed has been derived from the relationship, observed in many countries, between the rising share of long-term unemployment and the outward shift of the Beveridge curve (see Budd et al., 1987, for the U.K. and Germany; Franz, 1987, for Germany; Christl, 1988 for Austria; and Bourdet & Persson, 1991, for France). More directly, Muysken & de Regt (1990) have shown the negative influence of long-term unemployment on effective labour supply in the Netherlands. Further, Jackman & Layard (1991) provide evidence that the exit rate from unemployment in the U.K. is higher for new entrants than for the whole group of unemployed, which also confirms the hypothesis of negative duration dependence. Finally, studying U.S. unemployment data, van den Berg & van Ours (1993) find significant negative duration effects on exit rates for white workers. They find no significant effects for black workers.

With respect to the third mechanism, we can mention evidence for the U.K. by Layard & Nickell (1986), Nickell (1988) and Arestis & Skott (1993) and for Germany by Franz (1987) who included the share of long-term unemployment as an explanatory variable in wage or reduced price equations. A significant positive effect was found. Coe (1988) obtained similar results in a multi-country study. He concluded (p. 295) that "there is some evidence that the long-term unemployed exert a weaker influence on aggregate wage inflation". By contrast, Mulder (1990) and Graafland (1990) reject this conclusion for the Netherlands. (Graafland, 1988, had accepted it).

6. Unemployment persistence and the role of labour market structures and policies

In the previous sections various mechanisms were analyzed explaining why rising unemployment may cause the NAIRU to rise in the medium or even long-run. This section goes into the role labour market characteristics, which may either reinforce or counteract the working of these mechanisms. In comparison, this topic has received much less attention in the literature, both theoretically and empirically.

Among the characteristics that have received the larger part of this attention, are unionization, corporatism and centralization, and government labour market policy and regulation. Considering our findings in the previous sections, this is not surprising. *Unemployment persistence was suggested to become more serious, the more powerful the insiders are, the less the insiders care about the interests of the unemployed outsiders, the sooner the outsiders' search intensity and employability declines in a downturn and the longer it takes for these to be restored to the pre-*

recession level in a recovery.

Insiders derive their power from *labour turnover costs*, which make it difficult for the employer to replace them. At the very basis of these costs is government regulation (e.g. job security legislation introducing severance pay, notice requirements, minimum wages, etc.). In the words of Soltwebel (1988, p. 169), "the fact that unemployment persists seems to indicate that the cartels on the labour market are protected against endogenous market processes. This protection requires government activity as the ultimate source of power". Another major source of insider power emphasized in the literature is *unionization* and union activity. Though the insider-outsider theory does not require their existence, Lindbeck & Snower (1986) argue unions may reinforce insider power by coordinating insider actions (e.g. refusal to cooperate with new workers) and by providing the insiders with new 'tools' (e.g. strikes). Further, unions may amplify hiring and firing costs (e.g. by influencing hiring and firing procedures). Similarly, Blanchard & Summers (1986) suggest hysteresis is probably more likely to arise the stronger and the larger the union sector, though they also strongly reject the conclusion that unions are at the root of the problem. In their view hysteresis is primarily a product of bad times, rather than a reflection of structural problems, rigidities and government regulation.

In this respect, various authors see an important role for *corporatism and centralized wage bargaining*[11]. These labour market characteristics not only reduce union autonomy and power at the work-place, they also imply that in wage bargaining a higher weight will be attached to employment and thus to the outsiders' interests. First, as suggested by Lindbeck & Snower (1988b, p. 255-256), centralized unions' membership rules are more favourable to the unemployed since it may take longer for workers to lose insider status. Second, even if the unemployed immediately lose insider status in centralized unions too, centralized bargaining will better reflect their interests. Centralized unions are aware of the link between insider utility and outside conditions (e.g. because of the unemployment benefit-tax nexus and effects on the insiders' re-employment probability). Decentralized unions will consider these effects exogenous to their own behaviour and not take them into

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[11] See e.g. Blanchard & Summers (1986), Newell & Symons (1987), Barro (1988), Lindbeck & Snower (1988b, chapter 11), Summers (1988), Blanchard in a comment to Calmfors & Driffill (1988, p. 51), Layard & Bean (1989) and Nickell & Wadhwani (1990). In brief, wage bargaining is called centralized if the main negotiations take place at the national (rather than firm or industry) level between powerful, national unions and employer organizations. Corporatism requires wage bargaining to be centralized and labour markets to be characterized by the consensus model, instead of the conflict model (Bruno & Sachs, 1985; Calmfors & Driffill, 1988). Austria and the Nordic countries fit this pattern most (at least in the 1970s and the first part of the 1980s).

account (Calmfors & Driffill, 1988).

Layard, Nickell & Jackman (1991, p. 424) expressed strongly related, though slightly different ideas. They agree that unions may reinforce insider power and hysteresis effects, but add that in order to counter the use of this power, centralization of union organization is not enough. Strong employer organizations are equally necessary to avoid the creation of insider power on a national scale. Summers (1987, p. 614) supports this view. Furthermore, these authors see no problem in decentralization if it goes far enough. In small firms unions may either not exist or have difficulties to organize.

Structures and institutions not only affect the magnitude and use of insider power, they may also affect <u>the speed with which outsiders lose (and regain) employability and effectiveness</u>. In this respect, most attention has been paid to the generosity of the unemployment benefit system and the extent of government engagement in active labour market programmes. Jackman, Pissarides & Savouri (1990), however, also see an important role for *corporatism* here. Since corporatist economies are more egalitarian, they argue, and wages in different industries and locations closer to each other, the expected returns to additional job search are smaller and workers will accept a job offer more quickly. Further, they believe that in corporatist economies unions and employers are more willing to work for the success of labour market policies (cf. infra).

The influence of the *benefit system* on unemployment and unemployment duration has been studied by more than a few authors relying on more than a few theories. The central point is that benefits provide the unemployed worker with an income, which allows him to survive at least temporarily without working. His situation will be more comfortable to the extent that the level of benefits is higher, the period they are payable longer and the eligibility conditions less severe. In general, the literature expects a rise in the generosity of the benefit system to increase unemployment duration and thus increase the risk of workers becoming more and more ineffective and hard to employ suppliers of labour. In standard search theory (see e.g. Knight, 1987, chapters 3 and 7; Devine & Kiefer, 1991), benefits may not only reduce the incentive for a jobless worker to go out and search, they may also raise his reservation wage and make him more choosy about accepting jobs offered. According to the theory of 'wait unemployment' (see e.g. Burda, 1988b), more generous benefit systems increase the attractiveness to workers of the secondary sector to queue for higher wage jobs in the primary sector.

It must be added, however, that not all authors share this general view (e.g. Atkinson & Micklewright, 1991; Wadsworth, 1991; Schmitt & Wadsworth, 1993). The former emphasize the need to take into account the institutional details of the benefit system in most countries (e.g. disqualification for voluntary quitting or refusal

of suitable job offers, the requirement for previous insured employment, etc.). The general conclusions drawn in the literature about the effects of unemployment insurance may then be reversed. For example, a person setting a reservation wage may render himself subject to disqualification. Moreover, to the extent that there are binding restrictions on the capacity of the unemployed to borrow to finance search activity, unemployment benefits may increase the resources available for search and thus the probability of a return to work. Finally, the mere fact of receiving benefits may increase a worker's ties to the labour force through information or incentive effects (e.g. benefit receipt may be contingent on the demonstration of active job search).

Active labour market policy by the government is generally expected to reduce unemployment persistence (see e.g. Lindbeck & Snower, 1988b, chapter 11; Layard & Bean, 1989; Jackman, Pissarides & Savouri, 1990; Bourdet & Persson, 1991; Layard, Nickell & Jackman, 1991), although, again, not all authors agree to this unconditionally. In general terms, labour market policies such as training programmes, help to the unemployed in their job search, employment subsidies and temporary employment in the public sector, aim at enlarging the pool of workers that the employers will consider serious candidates for jobs (at given wages). By improving the employability of some groups of workers, facilitating contacts between suppliers and demanders and by reducing the cost of employing less skilled workers, effective labour supply at a given wage is increased and the bargaining power of the insiders reduced. Clearly, the ceteris paribus condition 'at given wage' is of crucial importance. For example, Calmfors & Nymoen (1990), Holmlund (1990), Calmfors & Forslund (1991) and Calmfors (1993) concentrate their critiques of active labour market policies exactly on showing that wage costs will rise and thus counteract the employment gain. Various channels may bring about this rise. First, to the extent that these policies reduce the expected welfare loss in the event of a layoff, they will take away incentives for wage moderation by the insiders, who will exploit government 'accommodation'. Second, to finance these policies taxes will have to be raised. Other points of criticism against active labour market policy relate to windfall, displacement and substitution effects (see Layard, Nickell & Jackman, 1991, chapter 10; Van der Linden, 1991; and Haveman & Hollister, 1991, for brief surveys). It is argued that many of those for whom employment subsidies are paid, would have been recruited anyway. In addition, some of those recruited merely replace others whom the firm would have hired instead. Similarly, many of those who owe their job to training or job search assistance programmes, replace others who did not benefit from these programmes.

7. Empirical evidence on unemployment persistence and the role of labour market structures and policies

Obviously, settling the issues raised in the previous sections requires further research. In this section we review the empirical evidence and try to answer three questions. To what extent has unemployment persistence or hysteresis been observed in reality? In which countries has it been observed? And what is the influence of labour market structures, institutions and policy?

Algebraically, hysteresis and unemployment persistence imply that the (short-run) NAIRU depends on lagged unemployment. In box 1 we investigated this issue in greater detail, relying on the analysis presented in section 5. There we derived an equation for the short-run NAIRU which underpins equation (4').

$$u^* = c_0 - c_1 q^* + c_2 z + \pi u_{-1} \qquad (4')$$

with : π : persistence parameter $(0 \leq \pi \leq 1)$

As we have mentioned earlier, the value taken by π determines whether rising unemployment has a long-run or only medium-run effect on the NAIRU[12]. If π equals 1, there is a long-run effect. This is the hysteresis case with an unstable long-run NAIRU. If $\pi < 1$, the long-run NAIRU is stable and equal to $(c_0 - c_1 q^* + c_2 z)/(1-\pi)$. This is the case of persistence. Many authors have tried to estimate π for a large number of OECD countries, some on the basis of wage equations (Phillips curves), others on the basis of dynamic unemployment equations. These two approaches are strongly related. The first approach consists of estimating equation (5').

$$\overset{\circ}{p} = \overset{\circ}{p}^e - a_2(u - \pi u_{-1}) + v \qquad (5')$$

The second approach follows if we rewrite (5') in terms of unemployment.

$$u = \pi u_{-1} + (v - \overset{\circ}{p} + \overset{\circ}{p}^e)/a_2 \qquad (11)$$

Depending on the assumptions authors make with respect to v and unexpected inflation, this equation is estimated as an AR(1) or ARMA(1,1) process. Often a constant and a time trend are included. (More recently, authors have mainly turned to

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[12] From equation (9) in box 1 can be derived that $\pi = 1$ if $a_2 = a_5 s_2$, i.e. if the long-run wage line becomes horizontal. Further, it can, among other things, be seen that π will be higher to the extent that the association between actual unemployment and the share of long-term unemployment is closer (s_2 is higher) and to the extent that the latter has a stronger impact on the wage bargaining outcome (a_5 is higher).

testing the existence of unit roots in the unemployment rate). We notice that a more general specification, with the NAIRU depending on more than one unemployment lag, implies e.g. AR(2) or ARMA(2,1) processes. In the Phillips curve - wage equation (5'), u_{-2} or u_{-3} may then become relevant. For completeness' sake, we further mention that in their empirical work some authors concentrate on employment instead of unemployment changes. To the extent that unemployment reflects external and employment internal labour market conditions, this distinction may be important.

Table 1 presents a summary of findings in seven empirical cross-country studies, trying to estimate persistence. Since, not unexpectedly, approaches and estimation methods differed (see the notes below the table), we chose to concentrate on the final results, i.e. on what these studies say about which country is vulnerable to hysteresis and which country is not. Even then, however, things were not easy and interpretation was necessary. Underlying this interpretation was the following rule of thumb. In the best case we could rely on the judgement of the author himself. If this was missing (e.g. in empirical work including a large number of countries and periods), we concentrated on point estimates for π (or related persistence parameters) and their standard errors. If these point estimates showed up insignificantly different from one, we concluded that vulnerability to hysteresis exists. In the other case, we concluded it to be absent. If, however, standard errors were also missing, we had to rely on the point estimates only. Absolute statements are then no longer possible. We called a country *relatively* vulnerable to hysteresis (i.e. compared to the other countries) if its point estimate exceeded the average over all countries by (quite arbitrarily) more than 15%. If its point estimate was lower than 85% of this average, hysteresis was decided not to exist. In the intermediate third case, "doubt remains".

In our view, the following conclusions can be drawn from this table. First, the hypothesis that the OECD countries, as a group, are vulnerable to hysteresis can neither be rejected, nor accepted. In each study several countries are found where hysteresis effects are shown not to exist. This does not imply that the same ambiguity applies to the alternative hypothesis of unemployment persistence. Indeed, though this cannot be derived from the table, this alternative hypothesis cannot be rejected for the OECD as a whole. The point estimates and the related standard errors (if mentioned) in the seven studies, leave no doubt about it that π differs significantly from zero in almost all OECD countries. This is no news, however. Macroeconomic evolution in the 1980s already made that clear. A second, and more important conclusion can be drawn that, even as far the individual countries are concerned, the findings of the various authors are far from consistent. The earliest view, expressed by Blanchard & Summers (1986) and confirmed by Graafland (1989), emphasizing the distinction between hysteresis in Europe and the absence of

Table 1. *Vulnerability to hysteresis in the OECD countries. A review of seven empirical studies*[13]

Authors (estimation period)	Countries vulnerable to hysteresis			Notes
	Yes	Doubt	No	
Blanchard & Summers (1986) (1953-84)	Germany, France U.K.		U.S.	1+2 1a+2
Coe (1988) (end 1960s-beginning 1980s)	U.K., Australia Germany, Finland Spain	Austria, Canada France Netherlands	Italy, Japan U.S.	1 1b
Graafland (1989) (1962-85)	six EC countries		U.S.	1+2 1a
Barro (1988) (1948-86)	Australia, Austria Canada, Denmark Finland, France Germany, Ireland Italy, Japan, U.K. Netherlands, Norway		Belgium, Sweden Switzerland U.S.	2 2
Heylen & Verhulst (1990) (end 1960s-1986)	Austria, Belgium France, Italy, U.K. Japan, Netherlands Norway, Switzerland		Canada, Denmark Finland, U.S. Sweden, Germany	2 1b
Alogoskoufis & Manning (1988) (1952-85)	France, Ireland Italy, Spain	Austria, Belgium Denmark, Germany Japan, Netherlands Switzerland, U.K.	Finland, Norway Sweden, U.S.	3 2
Layard, Nickell & Jackman (1991) (1956-85)	France, Ireland Italy, Netherlands Spain, Australia Finland	Canada, Denmark Sweden, U.K., U.S.	Austria, Norway Germany, Japan Switzerland Belgium	3 2

Sources and Notes:
The first note indicates whether we relied on (1) the authors' judgement, (2) point estimates and standard errors or (3) point estimates only (see main text for further explanation). The second note indicates the authors' approach. This may concentrate on (1a) estimating wage equations with the NAIRU depending on u_{-1} only, (1b) with the NAIRU depending on more than one unemployment lag or (2) estimating AR or ARMA processes.
Further notes : Blanchard & Summers estimate ARMA(1,1) processes for both unemployment and employment (including a time trend). They also estimate wage equations with current and lagged employment as explanatory variables (see their tables 4, 6, 7 and 8); Coe: see p. 300; Heylen & Verhulst: see their table 1; Graafland: the six EC countries, considered as one economy, are Belgium, France, Germany, The Netherlands, Italy and the U.K. (see his table 2); Barro estimates an ARMA(1,k) process for the log of the unemployment rate (see his table 1); Alogoskoufis & Manning estimate an AR(2,1) process for unemployment, including a constant and a time trend (see their table 4). We took the sum of the autoregressive coefficients as indicator of persistence. Layard, Nickell & Jackman estimate an AR(1) process including various other elements in the regression (their table 5, chapter 9).

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[13] Evidently, there are more empirical cross-country studies estimating vulnerability to hysteresis than those reviewed in this table (see e.g. Coe, 1985; Coe, 1989; Pedersen, 1990). These can, however, only confirm our conclusions. Layard, Nickell & Jackman present no less than three hysteresis indicators (see also their table 2, chapter 9). We calculated the correlation between these and, totally in line with our findings, found it to be not higher than 0.41 on average.

hysteresis in the U.S., is certainly no longer generally accepted by the evidence. A few examples make this clear.

Coe (1988) expresses doubts with respect to France. In a study on this country Sachs & Wyplosz (1986) reject both the persistence and hysteresis hypotheses. Layard, Nickell and Jackman (1991) and Heylen & Verhulst (1990) challenge Blanchard & Summers' view on Germany. The same ambiguity can be observed for other countries. Finland is found vulnerable to hysteresis in Coe (1988), Barro (1988) and Layard, Nickell and Jackman (1991). Alogoskoufis & Manning (1988) and Heylen & Verhulst (1990) obtain the opposite result. Japan is vulnerable to hysteresis according to Barro (1988) and Heylen & Verhulst (1990). In a country study on Japan, Brunello (1990) supports this view. Coe (1988) rejects it. Actually, only as far as the U.K., the U.S., Sweden and Australia are concerned, a certain degree of unanimity seems to exist. But even with respect to these countries, the results of Layard et al. (1991) may cause doubt. Neudorfer & Pichelmann (1989), who review some evidence with regard to the U.S. can only reinforce this doubt. Some of the studies they mention cannot reject the hysteresis hypothesis. Gordon (1989) observes traces of hysteresis in the U.S. as well.

Taking into account that the information obtained from estimating the parameter n is not particularly reliable, it may be more adequate to look at data for the share of long-term unemployment. Heylen (1992) opts for this approach. The idea is that the more a country is vulnerable to unemployment persistence or hysteresis, the higher the share of long-term unemployment will be. And the higher the probability that a person who loses his job, will still be out of work one year later. Table 2 reports data for the percentage of all unemployed who are unemployed for more than 1 year. The data are an average for 1987-89.

On the basis of these data it has to be concluded that especially Belgium, Italy, Ireland and Spain are vulnerable to unemployment persistence. In 1987-89 more than 60% of all unemployed had been unemployed for more than one year in these countries. By contrast, in Sweden, Norway, the U.S. and Canada, the probability that people who become unemployed remain unemployed seems to be quite low. In these countries the share of long-term unemployment was less than 10%. The other countries take intermediate positions, with the share of long-term unemployment between 40 and 50% in the Netherlands, France, Germany and the U.K. and between 15 and 30% in Denmark, Australia, Japan, Austria and Finland. Quite remarkable is to observe that the EC countries tend to be more vulnerable to long-term unemployment than the other countries. Undoubtedly, this partly explains why the development of unemployment and inflation in the 1980s was more unfavourable in the EC than on average in the OECD (see figures 1 and 2).

Table 2. *Share of long-term unemployment in the OECD countries (in %, 1987-89)*

Australia	26.7	Italy	68.6
Austria	16.2	Japan	19.7
Belgium	76.2	Netherlands	48.7
Canada	7.9	Norway	8.1
Denmark	28.4	Spain	60.7
Finland	16.0	Sweden	7.6
France	44.7	U.K.	43.8
Germany	48.0	U.S.	7.1
Ireland	66.6		

Sources: OECD, Data base on unemployment by duration and age groups;
Data for Austria: Altzinger & Weiss (1990, p. 284).
Note: These data have been taken from labour force surveys. While these make international comparisons easier (compared to data that are based on national registration practices), they are not perfect and must be interpreted with care (OECD, 1988, p. 12, 77, 86-89).

If one cannot reject the conclusion that *most OECD countries are vulnerable to unemployment persistence (though to diverging degrees)*, the question remains what drives this process. What according to the evidence makes temporary shocks to unemployment have medium-run effects on the NAIRU and what is the influence of structural and institutional characteristics of the labour market and labour market policy? The first question was already answered in the previous sections. In our reading of the evidence, wages are bargained between employers and unions, with neither party having the power to impose its most preferred outcome on the other and with a significant influence from external labour market conditions. Rising unemployment tends to persist mainly because it affects the skills and motivation of the jobless. These gradually lose their capabilities to exert downward pressure on the wage outcome and thus to buy themselves in again. A deterioration of skills and motivation makes the unemployed less attractive to the employers and contributes to a drying out of the pool of employable jobseekers. Both effects reduce the power of the employer to resist the employed's wage claims. The latter will certainly not always reflect concern for the unemployed.

As for the influence of structures, institutions and policy, the strongest evidence has been found for the beneficial effects of *corporatism and centralized bargaining*. Barro (1988) finds that unionization has a positive effect on the persistence of unemployment, but only in non-corporatist economies. Corporatism is found to reduce the estimated AR1 coefficient that Barro uses as an indicator of persis-

tence (see table 1). Heylen (1992), who concentrates on the effects of centralization, confirms Barro's findings: the share of long-term unemployment is found to be significantly higher in highly unionized countries, unless unions and wage bargaining are centralized. Nickell & Wadhwani (1990) show that insider effects (i.e. wage-setting with the aim of protecting the jobs of the employed) are larger in those British firms where wages mainly reflect the outcome of decentralized bargaining and do not take into account the outcome of national/industry wide agreements. Jackman, Pissarides & Savouri (1990) find that corporatism shifts the Beveridge curve inwards, which is an indication that labour supply is more effective and better fits demand in corporatist economies. In this respect, findings by Heylen (1992) that centralized countries spend significantly more on active labour market policy, may be highly relevant. Finally, Burda (1988b) shows that the long-term unemployment rate is lower in corporatist economies. The evidence by Alogoskoufis & Manning (1988) is less convincing. They find that wage-setters attach more weight to employment compared to wages in the centralized economies, but leave unanswered the question whose employment is taken care of. Is it only the insiders' employment or also the outsiders'? No clear pattern emerges in their work as far as the relation between centralization and membership rules are concerned.

The evidence on other structural aspects and policy characteristics is weaker. As for the effects of *the unemployment benefit system*, various authors argue that more generous benefits tend to be associated with longer periods of unemployment (see e.g. the surveys of the literature in Danziger, Haveman & Plotnick, 1981, p. 989-992; Flanagan et al., 1989, p. 588; Burda, 1988b, p. 404; Devine & Kiefer, 1991, chapter 5; and Layard, Nickell & Jackman, 1991, p. 255-256). Reviewing a number of studies for the U.S., Danziger et al. (p. 992) argue that "despite the problems [of empirical research], a positive relation between unemployment insurance and duration of unemployment appears robust". Burda, who includes studies for both the U.S. and some European countries (e.g. France and Germany), enthousiastically states that "there is already substantial microeconomic evidence of a relationship between the duration of unemployment and the level of unemployment insurance". He himself adds macroeconomic evidence that the long-term unemployment rate is higher in countries with more generous benefit systems.

In our reading of the literature, however, things are not so unambiguous, especially if one concentrates on the effects of changes in the benefit *level* (or replacement rate). For example, Peeters (1988, for Belgium), Steiner (1990, for Austria), Pedersen & Westergård-Nielsen (1986, for Denmark) and Groot & Jehoel-Gijsbers (1990, for the Netherlands) reject significant benefit effects on search behaviour, the re-employment probability or the share of the year spent in unemployment. For the U.K. Micklewright (1986, p. 118) concludes that "... the evidence from

microdata studies published in the 1980s has clearly been conflicting and no safe conclusion could be made at the present time about what the effect of benefits 'really is'. Some studies have found significant benefit effects, others have not"[14]. Atkinson & Micklewright (1991) and Pedersen & Westergård-Nielsen (1993), who review a wider range of evidence for more countries, also emphasize this lack of robust findings.

On the other hand, if one concentrates on the effects of benefit *duration*, empirical results tend to be somewhat more solid (which does not mean that they are unanimous). For example, on the basis of a cross-section study for the OECD countries, Layard, Nickell & Jackman (1991, p. 422-424) obtain that "benefit duration is crucial in generating long-term unemployment". Evidence by Jackman, Pissarides & Savouri (1990) that the Beveridge curve is closer to the origin in countries where benefits are payable only for a short period of time, supports this view. So does Heylen (1992). Controlling for differences in the macroeconomic context, the characteristics of wage bargaining, unionization and the extent of active labour market policy, Heylen obtains that the share of long-term unemployment is significantly higher in OECD countries with longer benefit duration. As for micro-economic research, it may be worth mentioning Katz & Meyer's (1990) results that there is a strong impact (in U.S. microdata) of benefit duration on unemployment duration. Finally, the OECD (1991, p. 207) also recognizes the impact of benefit duration, but argues for caution in drawing policy conclusions: "Monthly rates of exit from unemployment seem typically to decline in the first month or several months of unemployment, rise before benefit exhaustion, and reach peak levels in the month or several months after benefit exhaustion, before falling back again. For policy purposes, it seems important to try to assess both what proportion of unemployment is eliminated by time-limits on benefits, and what proportion of persons and families suffer poverty due to benefit exhaustion,...".

With regard to *active labour market policy* in general, Jackman, Pissarides & Savouri (1990) and Bourdet & Persson (1991) present evidence in favour. They find it to shift the Beveridge curve towards the origin. Similarly, Layard, Nickell & Jackman (1991, p. 422) show that the share of long-term unemployment in total unemployment is lower in countries that spend more on labour market programmes. The effect is, however, insignificant. Heylen (1992) obtains a significant effect (which is quite strong for expenditures on training). Calmfors & Nymoen (1990) and Calmfors & Forslund (1991), on the other hand, are sceptical. They find that labour

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[14] Unlike most studies mentioned above, which concentrate on unemployment duration (the outflow from unemployment into employment), Stern (1986) and Steiner (1989) examined the influence of benefits on the inflow into unemployment. They find no evidence that benefits play any role.

market programmes result in higher wages (and thus decrease regular employment) in Sweden, Denmark and Finland (but not in Norway). More recent work by Edin, Holmlund & Östros (1992) for Sweden and by Heylen (1993) for a cross-section of OECD countries contradicts the Calmfors view. Edin et al. (p. 54) conclude that "labour market programmes reduce wage pressure". Heylen obtains that active labour market policy increases the responsiveness of wages to unemployment.

As for the impact of particular categories of active policy, the following results emerge from the literature. *Public employment services and job search assistance* are more or less unanimously considered to exert positive effects (see e.g. Van der Linden, 1991, p. 52; Layard, Nickell & Jackman, 1991, p. 480). Consensus disappears, however, as far as *training programmes* are concerned. Raaum (1991) presents results from Norway which support the idea that training increases the re-employment probability of participants. Investigating the effects of the "Weer-Werk"-programme for the long-term unemployed in Flanders, De Witte (1992) draws an identical conclusion. On the other hand, Björklund (1990), who reviews some of the scarce evidence on the effects of training programmes in the U.S. and Sweden, can only conclude that he is unable to give reliable answers. Pedersen & Westergård-Nielsen (1993, p. 72) also call the (microeconomic) evidence "so far not conclusive". For various reasons it cannot be assumed that training always does good. First, participation in a programme implies that less time can be devoted to active job search. Second, participation can have negative signalling effects, telling employers that the jobseeker belongs to a problem group. And third, the fact must not be overlooked that training programmes may attract unemployed people for purely economic reasons (e.g. if refusal to participate implies deprivation of unemployment benefits, or to receive a training allowance).

One explanation of these ambiguous findings may concern methodological aspects (e.g. the fact that researchers often have to do without randomly assigned control groups). Another seems to be that the success of training programmes depends crucially on a number of conditions which may not always be fulfilled. For example, the OECD (1990, p. 37) emphasizes the need to focus on skill shortages. Van der Linden (1991, p. 50) and Haveman & Hollister (1991, p. 60) suggest that successful policies to improve effective labour supply require synchronized policies to increase demand for labour. And Calmfors (1993) and Haveman & Hollister (1991, p. 59) argue that training (and employment) programmes should concentrate on disadvantaged groups in the labour market (e.g. women, long-term unemployed people, less educated people). In Calmfors' reasoning, most of the currently employed workers will then not benefit from these programmes in the event of a layoff, and wage formation will remain unaffected.

With respect to *employment subsidy schemes*, the OECD (1990, p. 44-45)

admits that many subsidized jobs would have been created anyway. Often only about 20% are created as an immediate result of the schemes. Casey & Bruche (1985, p. 42-43) are even more pessimistic: they report 10%. However, the fact that recruitment subsidies generally favour persons with a weaker position on the labour market, may justify them. The effectiveness of the average unemployed person and the supply potential of the economy then rise. (In our view, the same idea applies to targeted training and job search assistance programmes). In this respect, results by De Koning (1991) suggest that wage subsidy schemes have a higher probability of getting long-term unemployed people back to work on a continuous basis to the extent that the subsidized contract period is longer and the provision of job training is stimulated. Finally, most doubts exist on the effectiveness of *temporary job creation schemes in the public or non-profit sector* (OECD, 1990, p. 51). Social objectives, instead of improving labour market efficiency, seem to underly these schemes. On the other hand, one should not ignore the possibility to use direct job creation programmes counter-cyclically, *i.e.* to maintain workers in employment and to prevent the decay of their human capital (Haveman & Hollister, 1991, p. 40).

Last, but not least, the evidence on the *effects of job security legislation* and hiring and firing costs is equally mixed. Bertola (1990) presents some tentative evidence that unemployment is more persistent in countries with more extensive job security legislation. This evidence cannot be considered strong, however. In particular, a ranking of (only) ten countries on the basis of the sum of the first and second order autoregressive coefficients in a dynamic unemployment equation is shown to be correlated negatively to a ranking based on the extent of job security legislation. Another problem with this evidence is that hiring and firing costs will stabilize (un)employment in more or less any environment. Bertola is unable to show that the relation found has anything to do with insider power and wage-setting. Barro's (1988) evidence also faces this problem. He uses the size of the government (the ratio of government expenditures to GNP) and data on mandated severance pay and required notice (published in Lazear, 1990) as alternative proxies for the extent of job security regulations. No significant effect on his AR1 coefficients can, however, be found.

8. Conclusions

At the end of this review of the literature it may be interesting to summarize some of the main findings. It should be noticed, however, that both the theory and the empirical evidence on unemployment persistence sometimes generate ambiguous results. As a consequence, the conclusions that we shall draw are to some extent

subject to our personal interpretation. The reader should be aware of this.

Temporary shocks to unemployment (e.g. caused by restrictive demand policy or declining world trade) may have medium-run effects on the NAIRU. It cannot be rejected that most OECD countries are vulnerable to unemployment persistence. They are vulnerable, however, to widely diverging degrees. Persistence seems to be particularly strong in the EC countries. The implication is that these countries may not yet have recovered from one recession when the next arrives. Reality in the early 1990s painfully proves this point.

Rising unemployment tends to persist mainly because it affects the skills and motivation of the jobless. These gradually lose their capabilities to exert downward pressure on the wage outcome and, thus, to buy themselves in again. A deterioration of skills and motivation makes the unemployed less attractive to the employers and contributes to a drying out of the pool of employable jobseekers. Both effects reduce the power of the employer to resist the employed's wage claims. Often, the latter do not reflect concern for the unemployed.

The magnitude of these persistence effects is strongly determined by the characteristics of the labour market and labour market policy. First, centralization of unions and employer organizations, as well centralization of wage bargaining, makes countries less vulnerable to unemployment persistence. Various pieces of evidence support the hypothesis that the employed in centralized countries pay attention to the interests of the unemployed. In non-centralized countries this is not the case. Second, as for the characteristics of the unemployment benefit system, it is mainly benefit *duration* that matters. Longer benefits tend to cause a rise in the duration of unemployment. The effects of changes in the benefit *level* are ambiguous. Third, in our reading of the literature active labour market policy can have favourable effects in the fight against unemployment persistence, though success may not be unconditional. Public employment services and job search assistance are almost unanimously considered beneficial. As for training programmes, some authors emphasize the need to focus on skill shortages and disadvantaged groups. Others suggest that supply-side policies can only be successful if complemented by policies to increase labour demand. Finally, though its effects are theoretically strong, convincing evidence for the adverse effects of labour turnover costs (e.g. firing costs) is hard to find.

With respect to policy implications, these conclusions are important. Unemployment persistence in the EC is not accidental. Except for Denmark, all EC countries have non-centralized wage bargaining (Calmfors and Driffill, 1988). Most have long (or even indefinite) benefit duration. And in all EC countries, except Germany, active labour market policy is quite weakly developed (Layard *et al.*, 1991). History will repeat itself.

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