

**HYSTERESIS IN UNEMPLOYMENT:  
A QUICK REFRESHER NOTE**

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## **Zusammenfassung**

Die Arbeitsmarktentwicklung der letzten beiden Jahrzehnte legt die Befürchtung nahe, daß sich ein zyklisch motivierter Anstieg der Arbeitslosigkeit im Laufe der Zeit in Form von struktureller Arbeitslosigkeit verfestigt. Dieser Prozeß wird in der Arbeitsmarktliteratur mit dem Begriff "Hysteresis" bezeichnet. Im vorliegenden Papier, das sich vorwiegend an nicht-spezialisierte Leser wendet, werden die Hauptargumente dieser Diskussion dargestellt.

## **Abstract**

Against the background of the rising tide of unemployment which has swept over most of the OECD countries since the early 1970s, the recent deterioration of labour market conditions has prompted fears that unemployment may become endemic in many countries. The experience of the past two decades, in particular in many European countries, does indeed suggest that unemployment after ratcheting up in cyclical downturns shows little tendencies to return to pre-shock levels when economic conditions improve. The apparently very weak self-correcting mechanisms with respect to unemployment have lent support to the hypothesis that there may be mechanisms that work that tend to transform cyclical shocks to unemployment more or less into changes in equilibrium unemployment. This phenomenon has been labeled as hysteresis or persistence. The purpose of this note is to provide an overview exposition of the hysteresis issue for non-specialized readers.

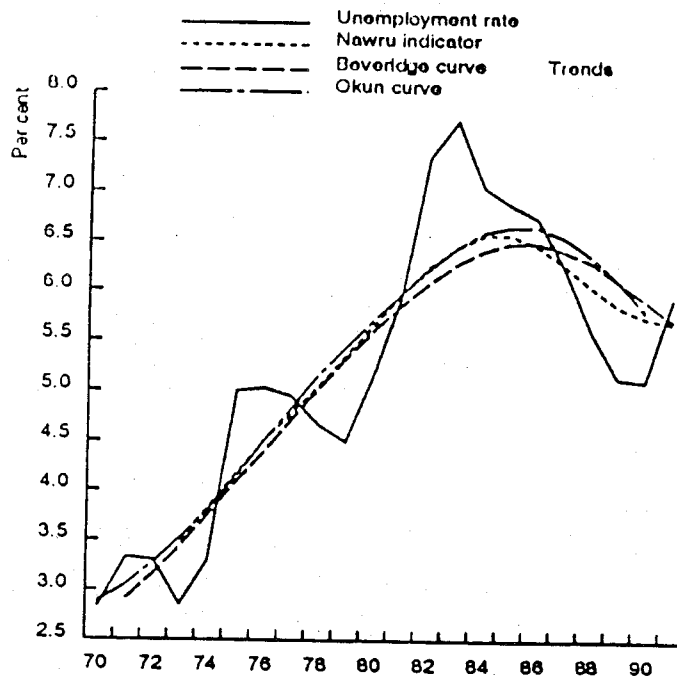


# Hysteresis in Unemployment: A Quick Refresher Note

## 1. Setting the Stage

Unemployment in the OECD area is projected to attain a new record level this year with the average number of unemployed expected to reach a staggering 34 million by the end of 1993. Against the background of the rising tide of unemployment which has swept over most of the OECD countries since the early 1970s, the recent deterioration of labour market conditions has prompted fears that unemployment may become endemic in many countries. The experience of the past two decades, in particular in many European countries, does indeed suggest that unemployment after ratcheting up in cyclical downturns shows little tendencies to return to pre-shock levels when economic conditions improve. The apparently very weak self-correcting mechanisms with respect to unemployment have lent support to the hypothesis that in many European countries equilibrium unemployment rates have risen substantially and are often found to stay uncomfortably close to actually observed rates of unemployment.

Figure 1: Indicators of the Trend OECD Unemployment Rate\*



\* The trends are based on yearly estimates of unemployment rates which would have (a) stabilised wage inflation, (b) resulted in a normal vacancy rate or (c) led to a normal rate of capacity utilisation. These estimates have subsequently been smoothed using the Hodrick- Prescott filter. Source: OECD Secretariat, 1993.

Figure 1 indicates that in virtually all OECD countries various alternative measures of trend unemployment, based on the notion of non-accelerating wage inflation, normal utilization of physical capacity, and normal vacancy rates respectively, tend to track the evolution of actual unemployment quite accurately. For the OECD area as a whole, trend unemployment rates had been steadily rising throughout the 1970s and the first half of the 1980s, and showed only a modest decline until the beginning of the 1990s. While the aggregate picture masks considerable differences in individual countries' experience, the pronounced trend increase in unemployment in many, primarily European, countries, poses a serious challenge to policy makers.

Over the medium term, and abstracting from business cycles, standard economic theory predicts a close to parallel movement of actual and equilibrium unemployment: the equilibrium rate of unemployment (usually defined as the rate of unemployment at which no upwards or downwards pressures on inflation arise from the labour market) is determined by set of steady-state levels of microeconomic structural factors affecting the demand and supply side of the labour market such as the unemployment compensation system, the demographic composition of the labour force, various types of labour market regulations and other factors influencing the allocative efficiency in the labour market. From this point of view, unfavourable shifts in the basic determinants of the natural rate have to be offset by higher actual unemployment if an ever accelerating inflation is to be avoided. When European labour market developments in the past two decades are interpreted along these lines, the only sustainable policy response to stubbornly high unemployment lies in the removal of structural impediments to the working of the labour market.

However, despite considerable efforts, it has been hard to identify changes in the basic determinants of the natural rate large enough to account for the observed trend increase in actual unemployment. Consequently, the alternative hypothesis has been put forward that unemployment may be strongly dependent on its own history. According to this view, which in its extreme form completely reverses the causal link between equilibrium and actual unemployment, current equilibrium unemployment is not independent of past actual unemployment, because of endogenous mechanisms that tend to translate movements in actual unemployment into changes of equilibrium unemployment. This phenomenon has been labeled as hysteresis or persistence<sup>1</sup>.

In the following discussion the term persistence will be used to refer loosely to the possibility that a period of high unemployment might essentially validate itself, in the sense that it endogenously generates mechanisms that preclude a rapid return to high employment conditions. It should be noted though, that persistence is, in principle, a feature of unemployment dynamics and, therefore, not necessarily related to the level of unemployment. This implies that mechanisms generating persistence in unemployment may well be present in low unemployment economies as well.

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1) For an overview on the hysteresis issue see e.g. Cross (1988), Layard and Bean (1989) or Empirical Economics (1990).

From an analytical point of view, a precise distinction should be made between hysteresis, implying that equilibrium unemployment is no longer uniquely defined and can be altered by macroeconomic policies, and persistence in unemployment; in the latter case the notion of unique natural rate – determined solely by structural factors – towards which unemployment converges in the long run is preserved, but high unemployment tends to slow down considerably the speed of adjustment towards equilibrium. However, both hypotheses share the common implication that in the wake of contractionary shocks inflationary pressures may already arise at unemployment rates well above long-run sustainable levels.

The upshot of the discussion so far is that it has proved very difficult to account for the apparent rise in unemployment consistent with stable inflation in many countries, in particular in Europe, in terms of the *natural rate of unemployment* paradigm. As an alternative, the hysteresis or persistence hypothesis has been put forward suggesting that there may be mechanisms at work that tend to transform cyclical shocks to unemployment more or less into changes in equilibrium unemployment. In the recent literature several possible mechanisms that might generate persistence in unemployment have been identified which will be briefly discussed in the next section.

### Hysteresis and the Unemployment–Inflation Tradeoff

The distinguishing feature of a process characterized by hysteresis is that the behaviour of the process cannot be described by reference to state variables alone; instead, additionally to state variables the past history of the process has to be invoked in order to explain its behaviour. Loosely speaking, the hysteresis hypothesis suggests that the experience of the journey may, by itself, lead to alternating the route and delaying arrival and even to a change in the final destination. In economic terms this means that the attained equilibrium position of an economic system depends on its own history and may therefore exhibit some degree of indeterminacy. The following simple technical exposition may be helpful in clarifying how traditional economic thinking about the tradeoff between unemployment and inflation is altered when the evolution of unemployment is subject to hysteresis effects. As a starting point, consider the following general formulation of the Phillips curve:

$$p = p^e - w(U - U^*) \quad (1)$$

where  $p$  and  $p^e$  denote, respectively, the actual and expected rates of inflation and  $U$  is the rate of unemployment. Equilibrium unemployment (the so-called NAIRU) corresponds to the steady-state situation when actual inflation is equal to expected inflation, so that  $U = U^*$ . Then,  $U^*$  itself is usually assumed to be determined by a set of structural factors affecting the demand and supply side of the labour market, but to be invariant with respect to business cycle conditions. Thus denoting the relevant explanatory variables by  $X$ ,

$$U^* = bX \quad (2)$$

The possibility of hysteresis arises when equilibrium unemployment in a given period also depends on actual unemployment in the past, as e.g.

$$U^*(t) = a U(t-1) + bX \quad (3)$$

In a steady-state, where actual inflation is equal to expected inflation and unemployment is constant, equilibrium unemployment is now given by

$$U^* = bX/(1-a) \quad (4)$$

As can be immediately seen from the above equation, when last period's actual unemployment is fully translated into equilibrium unemployment in the next period (the case  $a=1$ ), then steady-state equilibrium unemployment is no longer uniquely defined. any change in actual unemployment, e.g. brought about by macroeconomic policies, would also alter the NAIRU by the same amount; such a situation has been labelled as hysteresis. When actual unemployment feeds only partly into future equilibrium unemployment (the case  $0 < a < 1$ ) there is persistence in unemployment in the sense that the NAIRU evolves only slowly towards its steady-state level. In such a situation, the short-run NAIRU – meaning the level of unemployment at which there is no current upwards or downwards pressure on inflation – always lies between steady-state equilibrium unemployment and last period's actual unemployment. This carries the unpleasant implication that high unemployment can only be slowly reduced to its long-run equilibrium level when temporary increases in inflationary pressures are to be avoided. However, the dynamic trade-off between unemployment and inflation is likely to be more complicated than in the simple example outlined above. For example, unemployment may cycle after a one-off shock before it converges to its steady-state level. Thus, it can be the case that in the wake of a shock the short-run NAIRU even exceeds actual unemployment, implying that it takes additional unemployment to get inflation down in the short-run. Furthermore, persistence effects may be asymmetric, in the sense that upwards movements in actual unemployment are more easily translated into higher short-run equilibrium unemployment than vice versa.

## 2. Causes for unemployment persistence

One line of reasoning has stressed the role of physical capital formation to account for persistence in unemployment. The basic notion is that sustained periods of weak demand, low growth and high unemployment are likely to entail low investment which in turn may cause a *capital shortage* to emerge that posts a barrier to higher employment. Under this hypothesis quickly emerging product-market bottlenecks may give rise to *speed-limits* on the growth of real activity and employment when an increase in inflationary pressures and/or a worsening of the current account position is to be avoided.

However, most explanations for persistence generating mechanisms focus on the behaviour of labour market participants, changes in their productive capacity caused by unemployment, and on the resulting consequences for the matching process between workers and jobs. The general idea is a distinction between insiders and outsiders in the labour market carrying different weights in the wage bargaining process. When unemployment by itself tends to reinforce the outsider status of those affected, then the moderating impact of higher unemployment on wages will vanish over time. The same result will emerge when the (employed) insiders have sufficient market power, probably fostered by employment protection regulations, to safeguard their income claims and employment status against outside labour market conditions. Finally, a growing number of unemployed outsiders may create information distortions in the labour market, thereby making it more difficult to form suitable matches between workers' characteristics and the skill requirements of potentially available jobs.

The persistence generating mechanism that has gained most attention operates through changes in *human capital* in a broadly sense. According to this view, prolonged periods of unemployment may lead to a deterioration of skills and important attitudinal aspects of the work ethics and motivation of individual job seekers. And, obviously, when out of work, there are no opportunities for learning-by doing and on-the-job training. The loss of skills during unemployment may also lead to duration dependence in the probability of leaving unemployment, i.e. the likelihood that unemployed workers move to employment is likely to fall as the duration of unemployment increases. Furthermore, discouragement effects may over time loosen the attachment to the work force resulting in reduced job search intensities.

Even when the quantitative importance of human capital depreciation is considered to be fairly small, the mere fact of being out of work for a long time may convey a negative signal about worker's productivity to potential employers. consequently, the long-term unemployed may over time receive fewer and fewer job offers and may, finally, be even regarded as *unemployable*. The resulting disattachment from the labour market implies that the long-term unemployed may exert little or no downward pressure on wage increases.

Moreover, a growing number of *inefficient* job-seekers in the pool of the unemployed may reduce the speed by which vacant jobs can be filled by suitable candidates.

When specific skills are an important aspect of the employment relation, involuntary separations from a job may imply long *waiting* periods for re-employment; and when the loss of specific skills and the associated wage premium eventually has to be accepted, specific capital no longer provides a buffer between productivity and the value of employment elsewhere or non-employment, so turnover from new jobs, probably associated with recurrent unemployment, may be rapid. Loosely speaking, the argument is that any negative shock to employment is likely to produce another cohort of *restarting* workers – quite similar in labour market behaviour to young workers – and, thereby, to raise equilibrium unemployment.

Another major strand of reasoning puts the emphasis on the wage-bargaining behaviour of the employed insiders and on the role of adjustment costs. For example, when unions bargain mainly on behalf of the incumbent workforce, then a temporary adverse shock to employment will tend to perpetuate itself, because real wage demands are adapted to the now smaller number of employed insiders. More generally speaking, shifts in the employment composition in favour of groups facing little risk of unemployment may affect the overall bargaining stance of unions and thus reduce the wage-moderating impact of a given rate of unemployment.

For insider effects to persist, the employed insiders must command some degree of market power. This could stem from several sources such as training costs or statutory seniority systems, but also various forms of job security legislation. While the resulting reduction in turnover may well be in the interest of both the firm and the workers, the crucial point with regard to the persistence issue is that turnover costs may make it difficult for outsiders to provide efficient competition for jobs.

To sum up the discussion in this section, economic theory suggests several ways in which cyclical shocks to unemployment may leave some *permanent scars* both on the subsequent individual labour market career of those affected and on the overall employment level as well. However, while the theoretical possibility of the sketched persistence generating mechanisms seems largely uncontroversial, their empirical relevance is open to discussion.

### 3. Empirical evidence on persistence in unemployment

Formal time series analysis has become a popular starting point in the analysis of the persistence issue in order to reveal stylized facts about the evolution of unemployment rates. Loosely speaking, the common practice is to investigate whether today's unemployment may serve as the best forecast of tomorrow's unemployment, implying that higher unemployment tends to persist after contractionary shocks. Indeed, recent analysis undertaken by the OECD Secretariat strongly supports the notion that in most OECD countries shocks to the unemployment rate are highly persistent, with little or no tendencies for unemployment to revert to its starting point, the only clear exceptions being the United States and Sweden.

Another commonly applied test of hysteresis or persistence in unemployment is based on incorporating hysteresis-type proxies for the natural rate into aggregate wage equations. A simple variant suggests to look for the effects of past unemployment: when past unemployment tends to diminish, or even to offset, the wage-moderating impact of current unemployment, the rate of unemployment consistent with stable inflation will, at least in the short-run, be no longer independent of the history of shocks. An exercise along these lines, based on the estimation of two basic specifications of aggregate wage equations, has recently been performed by the OECD Secretariat. The overall picture emerging from the empirical analysis indicates that in many countries the wage response to unemployment is considerably stronger in the short-run than in the long-run. However, with the exception of Spain and Sweden, in all cases where the change in unemployment is significant, the level term still has the right sign and in many cases is statistically significant implying that the wage-moderating impact of higher unemployment levels does not completely disappear over time. No effects of past unemployment on wage inflation are found for Italy, Canada, Belgium, Netherlands, New Zealand, Norway, Portugal, Switzerland, Turkey, and somewhat surprisingly, Australia<sup>2</sup>.

There also seems to be considerable evidence for a number of countries that the wage-moderating impact of unemployment depends, *inter alia*, on the duration composition of unemployment. As the share of long-term unemployed usually tends to increase with higher overall unemployment, downward pressure on wages will also tend to be diminished. There are two other pieces of evidence that suggest to focus on outsider mechanisms rather than on insider forces generating persistence in unemployment. First, analysis of wage developments measured at the level of individual firms indicates that the unemployment rate in the outside labour market has a strong impact upon wages, while (lagged) employment within the firm has only a weak

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2) Pursuing a quite similar approach, Coe (1988) finds the strongest supportive evidence of hysteresis for the United Kingdom, Germany, Australia, Finland and Spain. His results also suggest that in many European countries, and particularly in the United Kingdom, the long-term unemployed exert less downward pressure on wages than the short-term unemployed.

effect, if any<sup>3</sup>. Second, and perhaps more important, if persistence in unemployment were mainly due to insider effects, higher unemployment should have no effect on the location of Beveridge-curve but should simply lead to a sharp drop in the vacancy rate, i.e. a movement along the curve relating unemployment and vacancies. However, as evident from Figure 1 there has been a pronounced outward shift of the unemployment-vacancy curve in most OECD countries which is consistent with a view that some of the unemployed, in particular, the long-term unemployed, may have become outsiders in the labour market<sup>4</sup>.

Physical capacity constraints, on the other hand, seem to be less likely to generate persistence in unemployment, except perhaps in the very short run. While recent research carried out under the aegis of the European Unemployment Program is indicative of *capital shortages* having become more important in some countries in the mid-1980s (Dreze, Bean 1990), the history of investment suggests that capacity responds quite quickly to its rate of utilization.

In summary, there seems to be a good deal of empirical evidence that mechanisms generating persistence in unemployment are at work in many OECD countries; the empirical support for the extreme case of hysteresis, however, appears to be rather weak. Among the various explanations for the persistence of unemployment several *human capital* effects, broadly defined, resulting in a reduced effectiveness of unemployed outsiders as job-seekers in the market appear to be the dominant suspects. However, this conclusion does not preclude a role for insider forces in wage bargaining as well.

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- 3) Nickell and Wadhvani (1988); Nickell and Kong (1988). Coe (1990), on the other hand, concludes from a cross-country and cross-industry analysis that wage formation in many industries is driven by a combination of insider and outside forces in most countries.
  - 4) Econometric evidence for some countries supports the hypothesis that a higher share of long-term unemployed has shifted the Beveridge-curve away from the origin; see e.g. Budd, Levine and Smith (1987).

#### 4. Conclusions

This note has attempted to present in brief theoretical considerations and some of the available empirical evidence pointing towards mechanisms that might be responsible for the persistence of unemployment. The discussion has identified various sources of unemployment persistence of potential empirical relevance suggesting that unemployment may breed unemployment, mainly by diminishing the effectiveness of the (long-term) unemployed as job seekers in the market. This points to two important policy conclusions. First, policy measures that enhance the labour market responsiveness to positive shocks by turning outsiders into insiders are important in fighting unemployment effectively. Second, when unemployment depends, at least partly, on its own history, avoiding shocks as far as possible or, when inevitable, cushioning the initial impact of shocks may be more effective than conventionally assumed.

The case for active labour market policies is considerably strengthened when persistence effects in unemployment are an important feature of the labour market. In countries facing a high proportion of long-term unemployed special measures to reintegrate those affected into the effective labour force could help to tighten their labour force attachment, thereby reducing inflationary pressures at given rates of unemployment. However, preventing the emergence of long-term unemployment in the first place, may be an equally important policy goal. Intensive placement and counselling activities geared toward people facing the risk of long-term unemployment may be an effective tool to counteract disenfranchisement from the labour market; obviously, the appropriate design of the incentive structure of the unemployment benefit system has a role to play as well. Furthermore, policies that curtail insider power, e.g. reforms in employment protection legislation and in the wage bargaining system in general, may also have a redistributive impact on the relative market power of insiders and outsiders in the labour market. And, obviously, as insider forces tend to generate rent-sharing activities, enhancing competitive conditions in output markets may be appropriate as well.

Finally, when today's unemployment tends to be partially translated into tomorrow's equilibrium unemployment, there are high returns to preventing the initial increase in unemployment. Obviously, this calls in the first place for sustainable and credible macroeconomic policies in order to avoid policy induced negative shocks to the economy. But there is also a strong rationale for sensible stabilization policies to cushion the initial impact of unavoidable shocks, for example by redesigning and strengthening built-in stabilizers in the economy. When the long-lasting effects of persistent unemployment are taken into account, these policies may prove far less costly than otherwise assumed.

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