The Unemployment Crisis

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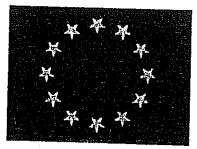

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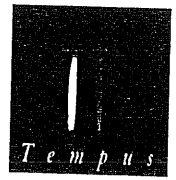

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1

Facts to be Explained

UNEMPLOYMENT matters. It generally reduces output and aggregate income. It increases inequality, since the unemployed lose more than the employed. It erodes human capital. And, finally, it involves psychic costs. People need to be needed. Though unemployment increases leisure, the value of this is largely offset by the pain of rejection.

So we have to explain why unemployment occurs, how it changes over time, and why it affects some kinds of people and not others. We can then suggest policies that will make things better.

Let us begin with some of the key facts that need to be explained.

1. Unemployment fluctuates over time

Some of these fluctuations are short-term changes which get reversed quite quickly. But there are also big secular changes (see Fig. 1). The 1960s were a period of very low unemployment. Since then unemployment has risen in most countries. The rise has been much worse in the European Community (EC) than anywhere else, with unemployment increasing in every year between 1973 and 1986 (from 3 to 11 per cent). After 1986 European unemployment fell very slowly until the early 1990s when it began to rise again.

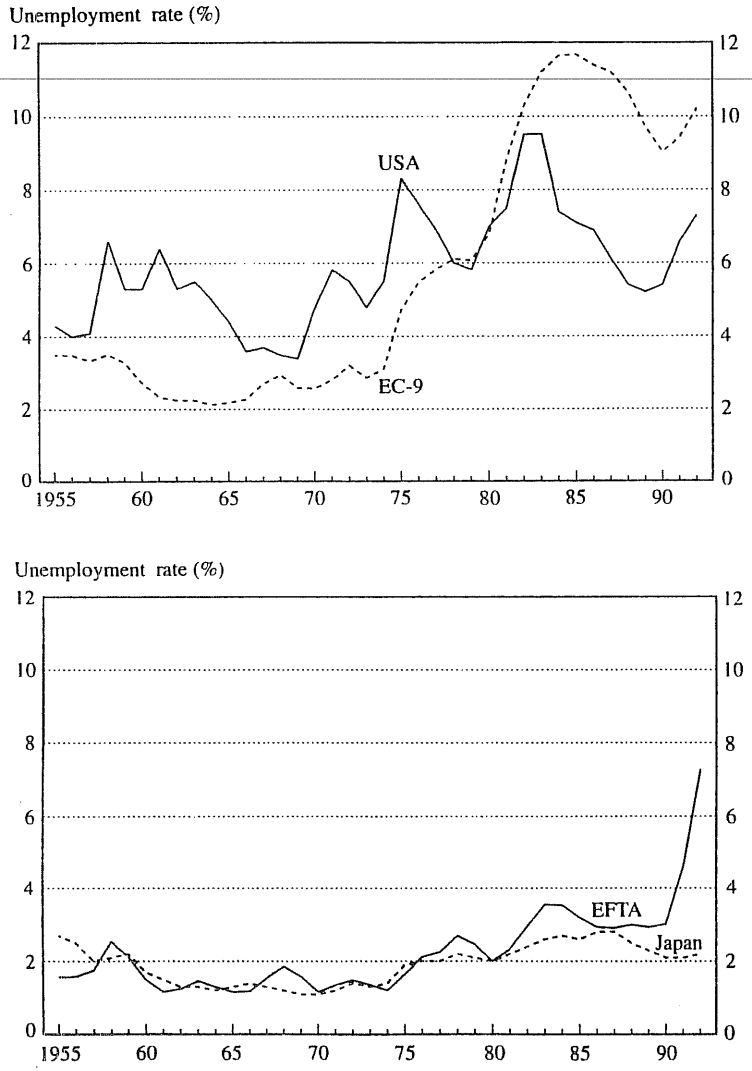


Fig. 1. *Unemployment, 1955–1992.*
EFTA (the European Free Trade Area) includes Norway, Sweden, Finland, Austria, and Switzerland. Detailed annual data for each country are in Annex 6.

Sources: see Annex 6.

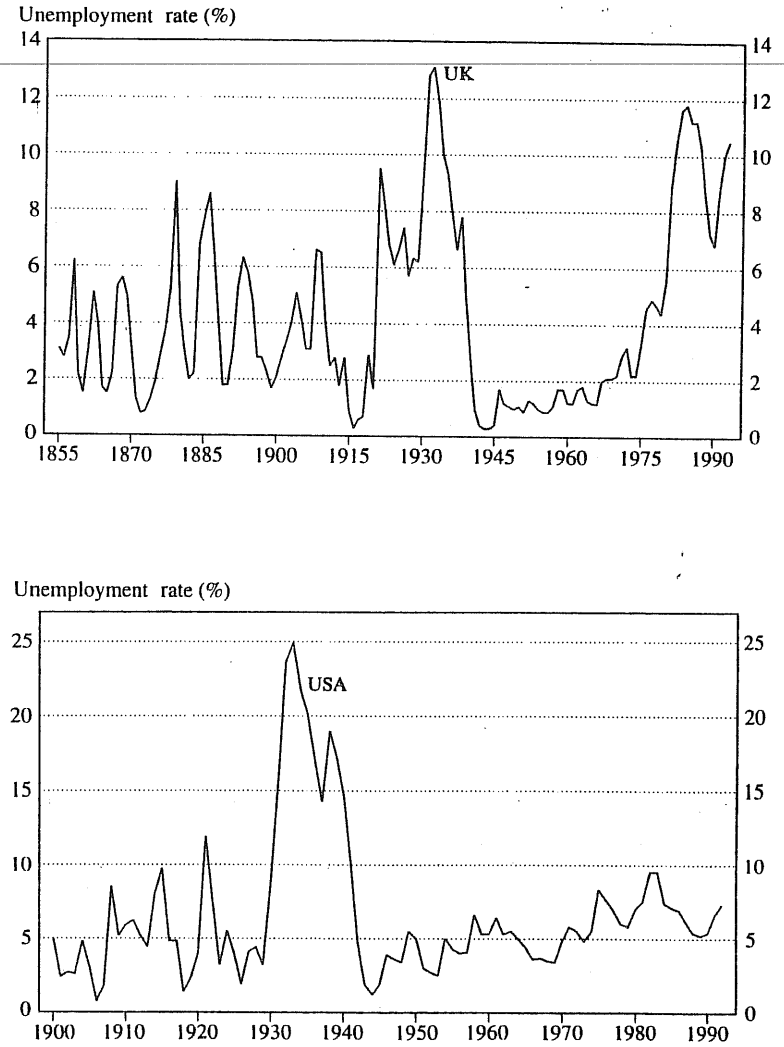


Fig. 2. *Unemployment since the nineteenth century.*

Sources: *UK*: Feinstein (1972), chained to data in Annex 6. OECD series. *USA*: 1890–1954: US Census, *Historical Statistics of the United States* (1976). 1900 Series D85–86, chained to 1955–1992 series in Annex 6.

2. *Unemployment varies much more between business cycles than within business cycles*

This is true of almost all countries. For example, unemployment rose hugely between the 1920s and 1930s, and then fell to very low levels in most countries during and after the Second World War.

This is illustrated for the USA and Britain in Fig. 2, which shows how much average unemployment varies between business cycles. To summarize this variation, we can divide the twentieth century into half-decades and take the average unemployment for each half-decade. For Britain the standard deviation of these averages is 3.16. This is hardly any less than the standard deviation of the *annual* unemployment rates, which is 3.36. The corresponding figures for the USA are 4.29 and 4.88. Thus, most of the annual variation 'comes from' the long-frequency fluctuations between half-decades rather than from the short-frequency fluctuations within half-decades.[1] Conventional business cycles account for relatively little of the history of unemployment.

The reasons for this are a central issue of this book. In our view they stem from two sources: first, there are long-period changes in social institutions; and, second, big shocks to the system (such as oil price rises or major wars) have long-lasting effects.

The main social institutions that affect unemployment are the unemployment benefit system and the system of wage determination. In Europe unemployment benefit systems generally became more generous financially and more readily available up to around 1980. This did not happen in the USA. In addition, the position of the unions became increasingly strong in Europe up to around 1980. Union membership grew in many countries, while it was falling in the USA. On most indices, militancy grew. For example, from 1968 onwards (the year of the Paris riots) the number of industrial conflicts rose sharply (see Fig. 3). Even before the oil shocks, increased militancy was making it difficult to contain inflation without rising unemployment.

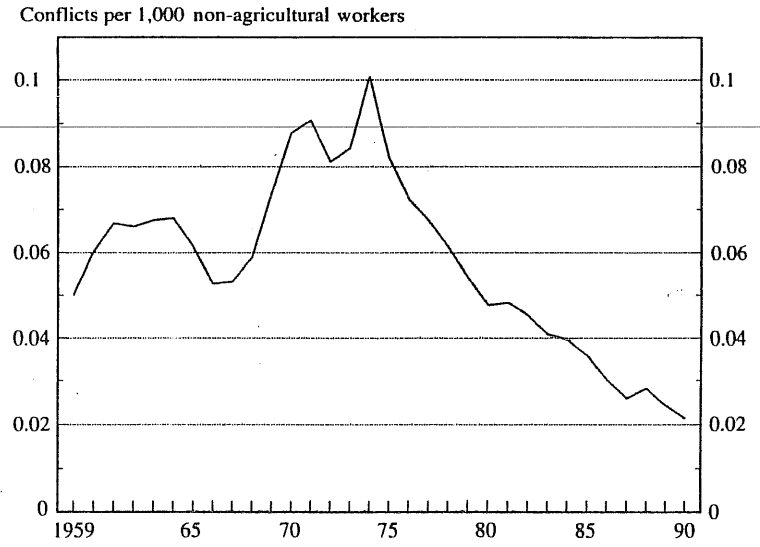


Fig. 3. *Industrial conflicts in the OECD, 1959–1990.*
Sources: ILO, *Yearbook of Labour Statistics*; OECD, *Labour Force Statistics.*

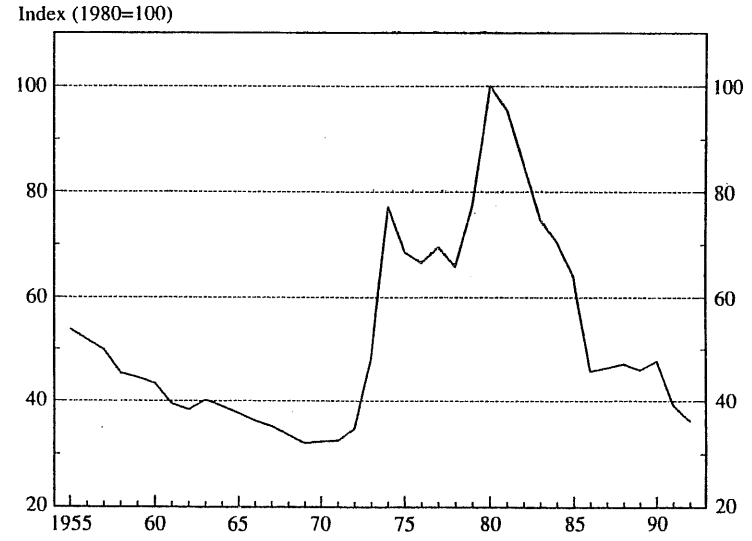


Fig. 4. *Real commodity prices (including oil), 1955–1992.*
Sources: UN, *Statistical Papers* Series M, no. 82, and *Monthly Bulletin*; IMF, *International Financial Statistics*; OECD, *Main Economic Indicators.*

Table 1 *Percentage of labour force unemployed, 1979 and 1990*

	1990			1979		
	All	*Under 1 year*	*Over 1 year*	*All*	*Under 1 year*	*Over 1 year*
Belgium	7.2	1.6	5.6	8.2	3.4	4.8
Denmark	9.6	6.8	2.8	6.2	—	—
France	8.9	5.4	3.5	5.9	4.1	1.8
Germany	4.9	2.5	2.4	3.2	2.6	0.6
Ireland	13.4	4.6	8.8	7.1	4.8	2.3
Italy	7.0	2.1	4.9	5.2	3.3	1.9
Netherlands	7.5	3.7	3.8	5.4	3.9	1.5
Portugal	5.1	2.5	2.6	4.8	—	—
Spain	15.9	6.6	9.3	8.5	6.1	2.4
UK	6.8	3.8	3.0	5.0	3.8	1.3
Australia	6.9	5.3	1.6	6.2	5.1	1.1
New Zealand	7.8	—	—	1.9	—	—
Canada	8.1	7.6	0.5	7.4	7.1	0.3
USA	5.4	5.1	0.3	5.8	5.6	0.2
Japan	2.1	1.7	0.4	2.1	1.7	0.4
Austria	3.2	2.8	0.4	1.8	1.6	0.2
Finland	3.4	2.8	0.6	5.9	4.8	1.1
Norway	5.2	4.6	0.6	2.0	1.9	0.1
Sweden	1.5	1.4	0.1	1.7	1.6	0.1
Switzerland	1.8	—	—	0.9	—	—

Source: Unemployment rates have so far as possible been standardized, as described in Annex 6. Percentage of unemployed who are unemployed over one year is from OECD, *Employment Outlook*, 1985, Table H (for 1979) and 1990, Table M (which refers to 1988 or 1989).

Notes: Detailed country series for unemployment and inflation are given in Annex 6.

Throughout this book, 'Germany' refers to 'West Germany'.

However, it was the big commodity price shocks of 1973–4 and 1979–80, shown in Fig. 4, that gave the sharpest impulse to inflation. And the ensuing efforts of governments to disinflate then led to the further rises in unemployment. Europe, as a major importer of raw materials, suffered much more from the commodity price rises than did the USA, which is much more self-sufficient. But what surprised everybody was the extraordinary persistence of European unemployment in the 1980s, and the fact that inflation fell so slowly despite mass unemployment. In our view, a key to understanding this is the emergence of long-term unemployment.

3. The rise in European unemployment has been associated with a massive increase in long-term unemployment (see Table 1)

In most European countries the proportion of workers entering unemployment is quite small: it is much lower than in the USA and has risen little. The huge difference is in the duration of unemployment: nearly half of Europe's unemployed have now been out of work for over a year. As we shall show, long-term unemployment reduces the effectiveness of the unemployed as potential fillers of vacancies. Once long-term unemployment has taken root, it has a very weak tendency to correct itself. This helps to explain our next fact.

4. In many countries the level of unemployment has risen sharply relative to the level of vacancies

This suggests either an increase in mismatch (which we question) or a failure of the unemployed to seek work as effectively as before.

5. Despite all this, unemployment is untrended over the very long term (see Fig. 2)

This is a key point. It suggests that ultimately there are

very powerful mechanisms at work which have forced the number of jobs to respond to huge changes that have occurred in the numbers of people wanting work. It also suggests that in the long term productivity and taxes have no impact on unemployment.

These are the main time-series facts about unemployment. We turn now to cross-sectional differences.

6. Unemployment differs greatly between countries (see Table 1)

Among industrial countries it is worst in the countries of the EC, while the other Western European (EFTA) countries (Norway, Sweden, Finland, Austria, and Switzerland) and Japan have been remarkably unaffected (see Fig. 1) (except very recently in the case of EFTA). This appears to be due to differences in social institutions, with the latter countries having highly corporatist wage-setting arrangements and/or shorter entitlements to benefits (combined in Sweden with major training and employment programmes for the unemployed). These arrangements both inhibited unemployment's original rise and ensured that unemployment did not persist. In the USA there was by contrast a big rise in unemployment in the early 1980s, but, with unemployment benefits running out after six months, this could not persist.

The differences in unemployment rates in Table 1 are quite genuine. People are defined as unemployed if they are not working but are available for work and have taken specific steps to find work within the last month. This is the standard OECD definition, and the data are generally got by household surveys such as the EC Labour Force Survey or the US Current Population Survey. Unemployed people do of course differ in the intensity with which they seek work and in the type of work they are willing to accept. We shall discuss this issue at length. But it in no way invalidates the concept of unemployment, any more than the concept of tallness is invalidated by the fact that, if we defined tall as 'over 6 feet', some people are even taller.

7. Few unemployed people have deliberately chosen to become unemployed

In the USA about a half have lost their last job, a quarter have re-entered the labour force after an interval, and over 10 per cent are looking for their first job. Figures for the UK are similar. Only a small minority become unemployed by quitting their last job. Thus, the issue of whether unemployment is in any sense voluntary arises mainly in relation to the duration of unemployment rather than the inflow into it.

8. Unemployment differs greatly between age-groups, occupations, regions, and races

As Table 2 shows, young people are much more likely to be unemployed than older people. In some countries like Italy and Spain the differences are truly astounding. And it is clear that countries differ less in the 'core' unemployment of adult males than in youth unemployment or female unemployment.

The most important difference in unemployment rates is between occupations. The rate for semi- and unskilled workers is four to five times higher than that for professional and managerial workers. Over three-quarters of unemployed men are manual workers. Thus, the theory of unemployment has to focus on the labour market for manual workers. The labour market experiences of economists will not throw much light on the subject.

The challenge is to find a consistent and plausible framework which explains the facts. Needless to say, the most plausible framework is one in which the actions of firms and individuals are described in terms that they would themselves recognize.

Table 2 *Percentage of labour force unemployed, 1987*

	All workers (1)	Over 25 Men (2)	Over 25 Women (3)	Under 25 Men (4)	Under 25 Women (5)
Belgium	11.0	5.6	15.3	16.0	27.1
Denmark	7.8	5.2	9.4	9.3	11.9
France	10.5	6.4	10.1	19.6	27.9
Germany	6.2	5.1	7.5	6.1	8.5
Greece	7.4	3.8	6.7	15.5	35.1
Ireland	17.5	13.5	18.5	27.2	22.6
Italy	7.9	2.3	6.5	21.0	30.1
Netherlands	9.6	6.8	11.7	14.2	14.3
Portugal	7.0	3.3	5.6	13.1	21.5
Spain	20.1	11.9	16.8	39.9	50.1
UK	10.2	8.8	8.0	16.9	14.6
Australia	8.0	5.6	6.1	15.0	14.5
New Zealand	4.1	1.9	2.4	6.1	5.5
Canada	8.8	7.0	8.4	14.9	12.5
USA	6.1	4.8	4.8	12.6	11.7
Japan	2.8	2.6	2.4	5.4	5.0
Austria	3.8	3.4	3.7	4.4	4.7
Finland	5.0	5.0	3.8	9.7	8.1
Norway	2.1	1.8	1.5	3.8	3.9
Sweden	1.9	1.4	1.5	4.4	4.0
Switzerland	1.8	—	—	—	—

Sources: For total unemployment see Annex 6. Age analysis is: *EC*, Eurostat, Series 3C, *Employment and Unemployment*, 1988, Table IV/1, all figures being multiplied by ratio of col. (1) to the Eurostat total; *Others*: ILO, *Yearbook of Labour Statistics*, 1988, Tables 1 and 9B, multiplied by ratio of col. (1) to ILO total.

2

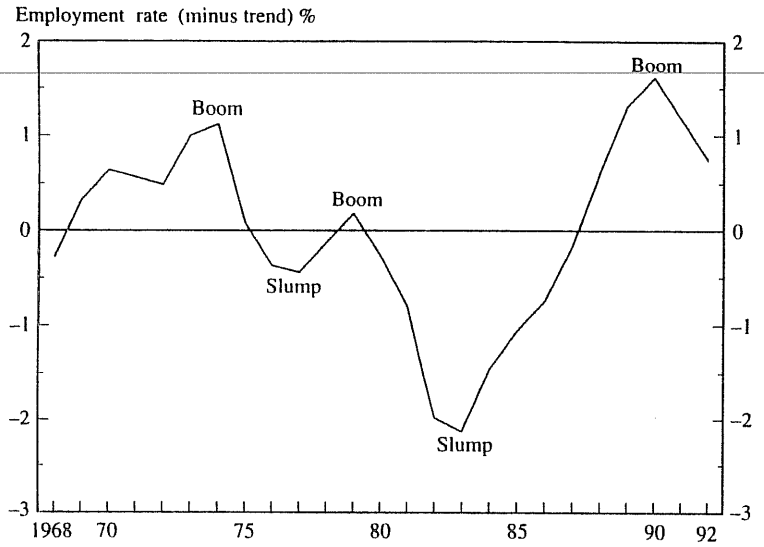
Our Broad Approach

In developing a framework, we start from the fact that, when buoyant demand reduces unemployment (at least relative to recently experienced levels), inflationary pressure develops. Firms start bidding against each other for labour, and workers feel more confident in pressing wage claims. If the inflationary pressure is too great, inflation starts spiralling upwards: higher wage rises lead to higher price rises, leading to still higher wage rises, and so on. This is the wage–price spiral.

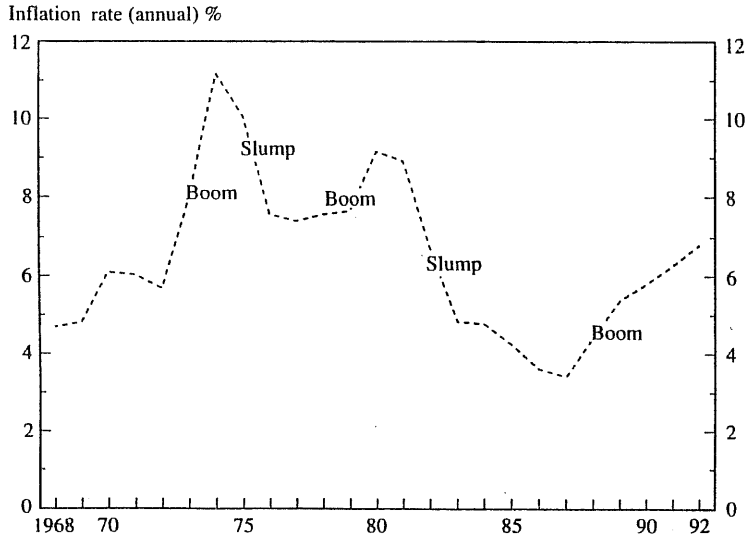
The outcome is illustrated for the OECD as a whole in Fig. 5. Panel (*a*) shows the level of economic activity measured by the (detrended) proportion of the labour force in work—in other words, the (detrended) employment rate. It shows clearly the pattern of boom and slump over the last quarter-century. Panel (*b*) shows the inflation rate (GDP deflator). In each boom inflation rose and in each slump it fell. Panel (*c*) therefore shows the relation between the change in the inflation rate and the level of employment. The association between the two is clear.[2]

But increasing inflation can be sustained only by continued monetary and/or fiscal injections. If financial policy is stable, with nominal income growing at a constant rate, rising inflation will in due course lead to rising unemployment. Eventually the higher unemployment will stop inflation rising, and both unemployment and inflation will stabilize.

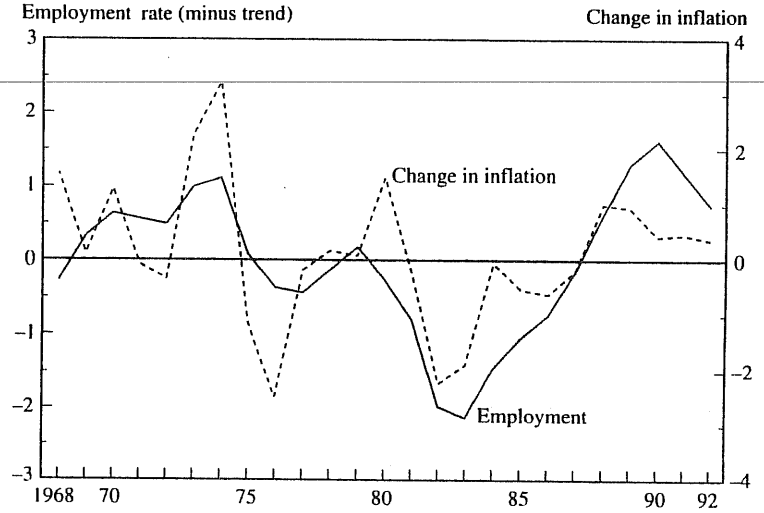
The level of unemployment at which inflation stabilizes is the *equilibrium* level of unemployment. This concept of equilibrium has nothing to do with the concept of 'market-



(a) Employment rate



(b) Inflation



(c) Employment rate and change in inflation

Fig. 5. *Unemployment–inflation trade-off in the OECD.* Inflation is change in GDP deflator.

Source: OECD.

clearing', any more than the equilibrium of a system of pulleys has to do with market-clearing. It simply represents the state to which the system will tend to return after a disturbance.

However, as we have seen, unemployment often takes a very long time to return to its original level. And it is not true that, once unemployment has risen, inflation starts to fall and continues to do so until unemployment returns to its original level. For example, in the EC inflation fell sharply in the early 1980s while unemployment was rising, but stabilized in the later 1980s when unemployment was still high but beginning to fall. This suggests that inflationary pressure is reduced not only by a high *level* of unemployment but also by *increases* in unemployment. Thus, if unemployment is falling (even though it is still high), inflation may not fall at all.

It is easy to see why inflation is affected not only by the level of unemployment but also by whether unemployment

is rising or falling. There are three main reasons. When unemployment is rising, people are losing their jobs, and when the employed 'insiders' bargain with their employers the fear of job loss induces wage restraint. But when unemployment is falling, very few workers need worry about their jobs and the fall in unemployment fuels wage pressure.

Second, if unemployment is rising, this means that last year's unemployment was low relative to this year's. Thus, the unemployed 'outsiders' include no large backlog of long-term unemployed, and employers perceive the majority of the unemployed as employable. This helps to restrain inflationary pressure. By contrast, if last year's unemployment was high relative to this year's, there will be a backlog of long-term unemployed, who will have become demoralized and deskilled and will not be perceived as desirable by employers. In this situation a given amount of unemployment will be less effective in restraining inflation. Third, even if unemployment is high, when it is falling and the economy is expanding, costs tend to be increasing sharply as firms move towards full capacity with overtime increases, shift premia, and so on. This tends to put upward pressure on prices and hence wages which will be exacerbated if employment adjustment or turnover costs make it expensive to expand employment.

If wage pressure depends not only on this year's level of unemployment but also on changes from last year's, we have to augment our concept of equilibrium unemployment. There is indeed a long-run equilibrium at which both unemployment and inflation will be stable.[3] We shall call this the long-run NAIRU (non-accelerating-inflation rate of unemployment).[4] But if last year we were above the long-run NAIRU and then fell back to it immediately, we would have rising inflation. There is however some 'short-run NAIRU', which *would* be consistent with stable inflation, and which of course depends on last year's unemployment. In this view of the world there is short-term 'hysteresis', in the sense that past events affect the current short-run

NAIRU. But there is no long-term 'hysteresis': there is a unique long-run NAIRU. In the end, the unemployment rate always reverts. And employment always adjusts to the size of the labour force.

Thus, the theory of unemployment goes as follows.

1. There is a long-run NAIRU which depends on social and economic variables. It is of course subject to long-term change (e.g. from different benefit systems or wage-bargaining arrangements) and to temporary change (e.g. from changes in oil prices).
2. Demand shocks move employment away from the NAIRU and move inflation in the same direction as employment.
3. Supply shocks move employment by moving the NAIRU, and move inflation in the opposite direction to employment.
4. Once unemployment is away from the NAIRU, it takes some time to return even if inflation is stable.

There is no point trying to label this theory as Keynesian or classical. It has classical elements (the NAIRU) and it has Keynesian elements (the role of demand and the role of persistence). So it is best to avoid the use of those terms, which mean something different to every reader.

The issue of market-clearing

As we have said, our concept of equilibrium does not imply market-clearing. Everyone knows that some people fail to get jobs, while others who are just like them succeed. What explains this process of job rationing? Why do firms not drop their wages, so that it becomes worthwhile for them to employ the extra workers? There are two main explanations. First, every personnel director will tell his board that this will reduce morale and cause trained workers to quit; the losses from this would outweigh the savings made on

the lower wages. This is the 'efficiency wage' explanation. Second, the union may prevent the firm paying less.

But we have to be careful here. Even when unemployment is high, there are not queues for all vacancies. There is a small secondary sector of the labour market that does more or less clear (e.g. in catering, cleaning, some maintenance and repairs, retailing and construction). If people are unemployed, it is generally because they have decided against these jobs. They are however willing to work in a range of good 'primary' sector jobs, but they cannot get them. In this sense unemployment is both voluntary and involuntary.

Outline

Our task now is to develop this framework in more detail, and to use it to explain the facts. When we have done this, we should have a good idea about how unemployment can be reduced.

Thus we shall proceed by asking (and answering) the following ten questions:

- What determines equilibrium unemployment?
- Why does unemployment fluctuate?
- How do real wages relate to unemployment?
- If labour markets don't clear, why don't wages fall?
- How do import prices, taxes, and productivity affect unemployment?
- How does job-search behaviour affect unemployment?
- Is unemployment voluntary or involuntary?
- Why are some groups more unemployed than others?
- Why has unemployment differed between countries?
- How can unemployment be reduced?

3

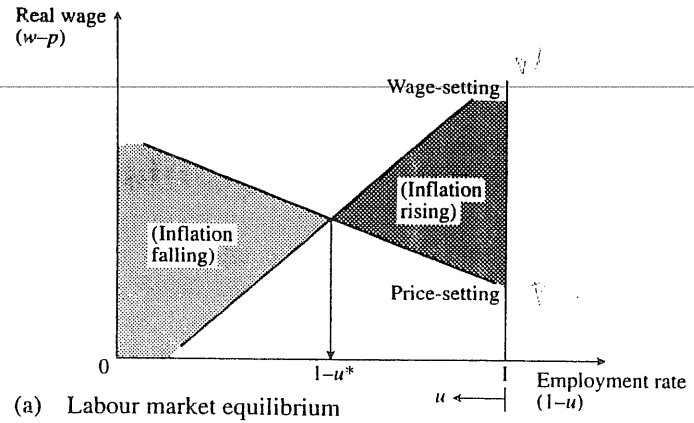
What Determines Equilibrium Unemployment?

When buoyant demand reduces unemployment (at least, relative to recent average values) inflationary pressure develops, and when unemployment is high the reverse happens. In a sequence of years when the average price level is stable, inflationary pressure means rising prices; in a sequence of years when the average inflation rate is stable, inflationary pressure means rising inflation. Since around 1970 the latter case is the most relevant, and, as we have seen in Fig. 5(*c*), there is a clear positive relation between changes in inflation and the (detrended) employment rate. In each case high employment applies an impulse to the inertial process by which prices are evolving, and a wage–price spiral develops with wages and prices chasing each other upwards.

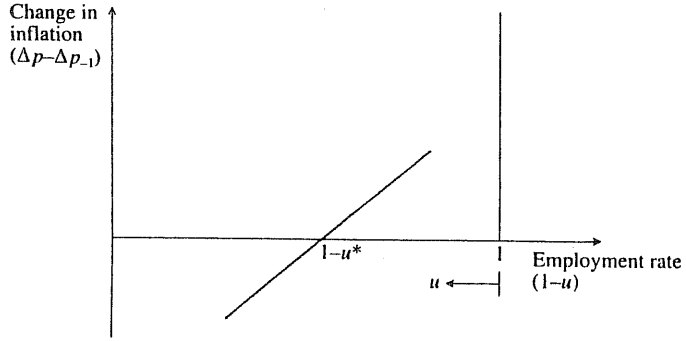
Wage-setting and price-setting

Why exactly does a wage–price spiral develop? The answer is that stable inflation requires consistency between

(*a*) the way in which wage-setters set wages (W) relative to prices (P), and
(*b*) the way in which price-setters set prices (P) relative to wages (W).



(a) Labour market equilibrium



(b) Relation between unemployment and inflation

Fig. 6. *Unemployment and inflation.*

Only if the real wage (W/P) desired by wage-setters is the same as that desired by price-setters will inflation be stable. *And the variable which brings about this consistency is the level of unemployment*. This affects the wage mark-up and also (probably) the price mark-up. Thus, inflation will be stable only if unemployment is at the appropriate equilibrium level. By the same token, if financial policy ensures that inflation *is* stable, then unemployment will adjust to its equilibrium level in the long run.

Thus, unemployment is the mechanism which eventually ensures that the claims on the national output are compatible. If a worker produces 100 units of output priced at \$1 and wage-setters set his wage at \$60, then the worker gets 60 units of output and profit-receivers get 40 units per worker. If this is what wage-setters and price-setters intended, we have an equilibrium. But if wage-setters aim at 61 units (W/P = 61) and price-setters aim to provide profits per worker equal to 41 units (W/P = 59), we have an inconsistency. This leads to a wage–price spiral, as wage-setters try to recoup the losses imposed on them by price-setters, and vice versa. In the long run, unemployment will have to be higher in order to reduce both sets of claims until they are equal with each other. Only in this way is the wage–price spiral eliminated.

There is another equally important spiral which unemployment eliminates. This is the wage–wage spiral. If unemployment is too low, wage-setters will try to raise their relative wage. Only if the labour market is slack enough will this leapfrogging be eliminated. In equilibrium, unemployment must be high enough to induce each particular wage-bargain to equal the bargain expected to prevail elsewhere.

We can illustrate all this with the following stripped-down model, in which parameter symbols are written as positive. We look first at price-setting, then at wage-setting. Prices (of value added) are set as a mark-up on expected wages. The mark-up tends to rise with the level of activity although this effect may not be very strong. (And if it is non-existent we have 'normal-cost' pricing.) Thus,

$$p - w^e = \beta_0 - \beta_1 u \qquad (\beta_1 \geq 0), \tag{1}$$

where p is log prices, w^e log expected wages, and u the unemployment rate. This is graphed in Fig. 6(*a*) as the intended real wage set by price-setting. It can, if one likes, be thought of as the 'feasible' real wage—that real wage which (for given productivity) price-setters are willing to concede.

We turn now to wage-setting. Wages are set as a mark-

up on expected prices, with the mark-up tending to rise as the employment rate rises and unemployment falls. Hence

$$w - p^e = \gamma_0 - \gamma_1 u \qquad (\gamma_1 > 0). \tag{2}$$

This is graphed in Fig. 6(*a*) as the intended real wage set by wage-setting. It is, if you like, the 'target' real wage which wage-setters intend.

If actual wages and prices are at their 'expected' values ($p = p^e$, $w = w^e$), the equilibrium unemployment rate is given by adding (1) and (2) to obtain

$$u^* = \frac{\beta_0 + \gamma_0}{\beta_1 + \gamma_1} \tag{3}$$

This is illustrated in Fig. 6(*a*). The wage-setting and price-setting lines are drawn for $p - p^e = w - w^e = 0$, and their intersection determines equilibrium unemployment and real wages. Any factor that exogenously raises wage push (γ_0) or price push (β_0) raises the equilibrium rate. Any factor that raises real wage flexibility (γ_1) or price flexibility (β_1) reduces the equilibrium rate.

Unemployment and changes in inflation

If expected values of prices and wages are *not* realized, we have

$$u = \frac{\beta_0 + \gamma_0 - (p - p^e) - (w - w^e)}{\beta_1 + \gamma_1}$$

or

$$u = u^* - \frac{(p - p^e) + (w - w^e)}{\beta_1 + \gamma_1}$$

Assuming that the 'surprises' on wages and prices are similar,

$$u - u^* = -\frac{1}{\theta_1}(p - p^e), \tag{3'}$$

where $\theta_1 = (\beta_1 + \gamma_1)/2$, which is a measure of real wage and price flexibility. Thus, low unemployment is associated with positive price surprises.

Suppose that we are in a period when inflation (Δp) is not expected to change. Then it is perceived as a random walk with

$$\Delta p = \Delta p_{-1} + \epsilon,$$

where ϵ is white noise, Δ means the change since the previous period, and -1 means one period earlier. Then the rational forecast of inflation is

$$p^e - p_{-1} = \Delta p_{-1}.$$

In consequence, the price 'surprise', $p - p^e$, is

$$p - p^e = p - p_{-1} - \Delta p_{-1} = \Delta p - \Delta p_{-1} = \text{change in inflation.}$$

Price surprises are equivalent to increases in inflation. The same is true of wages.

Thus, equation (3') implies that

$$\Delta p - \Delta p_{-1} = -\theta_1 (u - u^*). \tag{3''}$$

This is a standard Phillips curve relation and is shown in Fig. 6(*b*). When unemployment is lower than u^*, inflation is increasing; and vice versa. Thus u^* can be thought of as the non-accelerating inflation rate of unemployment (NAIRU).

Notice that inflation in one year is influenced by previous inflation. There is thus an element of 'nominal inertia' in the system: nominal prices are influenced by past history, and not only by forces at work today. The explanation of nominal inertia which we have just given is that the past influences expectations (so that unemployment can fluctuate only if expectations turn out to be wrong). But in fact, as we shall explain later, nominal inertia arises also from staggered wage- and price-setting, and from the cost of changing wages and prices.

4

Why Does Unemployment Fluctuate?

In the long run, unemployment is determined entirely by long-run supply factors and equals the NAIRU (u^*). But in the short run, unemployment is determined by the interaction of aggregate demand and short-run aggregate supply. Short-run aggregate supply is given by

$$\Delta p - \Delta p_{-1} = -\theta_1 (u - u^*). \qquad (3'')$$

Aggregate demand is (with suitable choice of units) given by

$$u = -\frac{1}{\lambda}(m - p),$$

where m is the log of nominal GDP (adjusted for trend real growth). This aggregate demand relation implies that

$$\Delta p = \Delta m + \lambda(u - u_{-1}). \qquad (4)$$

This demand curve (D) is drawn together with the short-run aggregate supply curve (SRS) in Fig. 7(a). Together they determine the current levels of unemployment and inflation.

This framework brings out two key points. First, a 'demand shock', associated with a rise in Δm, will shift D outwards and thus raise both inflation and employment. By contrast, a 'supply shock', associated with a rise in u^*, will also raise inflation but will reduce employment (see Fig. 7(b)).

The general expression for the level of unemployment is, from combining (3") and (4),

$$u = \frac{1}{\theta_1 + \lambda}[\theta_1 u^* + \lambda u_{-1} - (\Delta m - \Delta p_{-1})] \qquad (5)$$

If Δm is constant for long enough and u^* is constant, Δp_{-1} converges on Δm and unemployment converges on u^*.

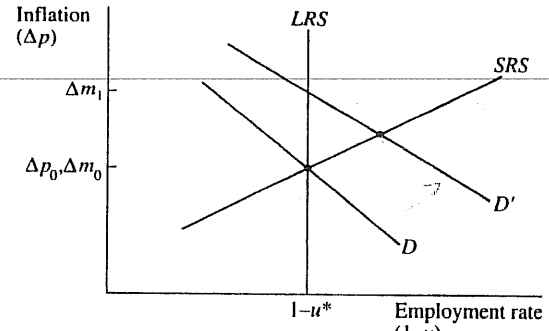
This provides an adequate framework for analysing the history of our times.

Demand and supply shocks

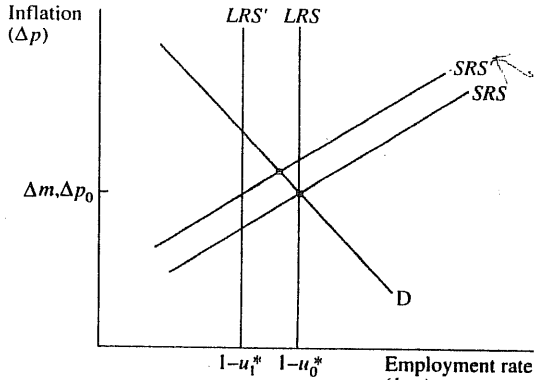
In the late 1960s and early 1970s demand was stoked up, partly because of the Vietnam War. Δm rose, dragging up inflation and driving down unemployment (see Fig. 7(*a*)).

But, partly as a result, there followed in 1973–4 the huge rise in the price of commodities, including oil, mostly supplied from outside the OECD. This (together with greater union militancy) raised the NAIRU in the OECD, at least for a time—from u_0^* to u_1^*. The short-run aggregate supply curve therefore shifted leftward (see Fig. 7(*b*)). In consequence inflation rose, but this time unemployment rose also. Many analysts at the time were baffled, since they had been educated to believe that inflation and unemployment always moved in opposite directions, as in Fig. 6(*b*). But this is true only when the shock is a demand shock: with a supply shock, inflation and unemployment move together.

Following on the first oil shock there was little demand deflation, so inflation fell little. But then followed the second oil shock in 1979–80, which again raised inflation and also unemployment. At this point the electors in most countries declared that enough was enough: inflation must be reduced. There followed massive demand deflation in all countries, and by 1985 OECD inflation had been reduced to the same level as existed in 1969. At the same time, OECD unemployment had risen by over a half.



(a) A demand shock



(b) A supply shock

Fig. 7. *Aggregate supply and demand:* (a) *a demand shock;* (b) *a supply shock.*

It was already evident by the middle 1980s that European inflation was coming down much more slowly than might have been expected, given the high level of unemployment. Since then performance has been even more disappointing. In 1985–6 we had a beneficial oil shock, and real commodity prices fell to the same level as around 1960. One would have expected this to produce a major fall in inflation and unemployment. There has indeed been some fall in unemployment, but OECD inflation by the end of the 1980s was the same as in 1985.

Persistence

These disappointing experiences have raised in sharp form the issue of hysteresis in unemployment. Clearly, we have to modify our model to allow for this. If wage and price behaviour depends on the change in unemployment as well as on its level, the aggregate supply curve (3") becomes[5]

$$\Delta p = \Delta p_{-1} - \theta_1(u - u^*) - \theta_{11}(u - u_{-1}). \qquad (3''')$$

Thus the short-run NAIRU (u_s^*) is given by

$$u_s^* = \frac{\theta_1}{\theta_1 + \theta_{11}} u^* + \frac{\theta_{11}}{\theta_1 + \theta_{11}} u_{-1}.$$

It lies between last period's unemployment and the long-run NAIRU.[6] The higher the effect (θ_{11}) of the change in unemployment relative to the effect (θ_1) of the level, the nearer is the short-run NAIRU to last year's unemployment.

In terms of policy, hysteresis means that, once unemployment has risen, it cannot be brought back at once to the long-run NAIRU without a permanent increase in inflation. But it can be reduced gradually without inflation rising.

Hysteresis clearly helps us to understand why inflation did not fall in Europe over the later 1980s. But there is also another important element: the fact that extra unemployment has a smaller effect on wages when unemployment is already high than it does in a tighter labour market. One can think of many reasons why wage-setters would respond in this non-linear way. For example, if an employer found he had 2 applicants per job rather than 1, he would relax his wage by more than if he had 12 applicants rather than 11.

Thus, the large extra unemployment of the 1980s had quite a small deflationary effect. By contrast, the small excess demand of the early 1970s produced quite large increases in inflation.

5

How do Real Wages Relate to Unemployment?

The next question is, Where do real wages fit into the picture? It is often claimed that unemployment occurs because real wages are too high. Is this true? We can discuss the issue first in the long term and then in the short term. Both analyses draw on Fig. 6(*a*).

In the *long term* the issue is whether the mark-up of price over wage-cost rises with the level of economic activity; i.e., does the 'price-setting' real wage in Fig. 6(*a*) slope down to the right? This is a matter of controversy.

We can begin with the extreme case of 'normal-cost pricing', where (for a given level of trend productivity) the price mark-up is constant. In this case, if there were a spontaneous increase in wage pressure, it would not actually have any effect on real wages. But it would raise unemployment, as illustrated in Fig. 8. Thus the problem is not that real wages are too high, but that too high real wages are desired at given unemployment. This is always the root of the problem. There can be extreme problems of wage pressure without any evidence of an actual 'wage gap', and indeed the whole concept of the wage gap tends to confuse rather than clarify.

Of course, if economic activity does raise the price mark-up, as in Fig. 6(*a*), then extra wage pressure will indeed raise real wages as well as unemployment. But the ultimate cause of both unemployment and higher real wages is the

8

How Does Job-Search Behaviour Affect Unemployment?

This is the element that has so far been lacking from our analysis. The unemployed have not appeared at all as people, whose behaviour matters—merely as pawns, whose number reconciles the claims to the national output. This is not the case, and it is time to expand the model to show how job search affects the equilibrium number of jobs.

The mechanism is this. Wage pressure builds up unless there is a sufficient excess supply of labour. (Firms bid up wages against each other and unions feel strong enough to press their claims.) But if the unemployed seek harder for jobs, this raises the effective excess supply of labour. (Firms can get workers more easily and disemployed people face fiercer competition for jobs.) Thus, if unemployed workers seek harder, there need be fewer of them in order to restrain wage pressure.

This leads us to modify our earlier wage equation to make wages depend on cu rather than u, where c measures the 'effectiveness' of the average unemployed job-seeker. To see exactly how this enters in, we shall start from a rather more structural wage function than we had originally. We shall now assume that, from the point of view of a worker facing possible unemployment, what matters is the chance of getting a job if he searches with a given effectiveness (say with $c = 1$). This chance is H/cU, where H is the number of

unemployed people hired per period, U is the number of unemployed, and cU is the number of effective unemployed. But in equilibrium, the numbers hired equal the numbers becoming unemployed. If the fraction of employed workers (N) who become unemployed is s, this means that in equilibrium $sN = H$, so that

$$\frac{H}{cU} = \frac{s}{cU/N} \simeq \frac{s}{cu}.$$

This becomes the relevant variable to explain the wage pressure coming from the workers in wage bargaining.

There is also the wage pressure coming from the firms. This depends on the chances of their filling each vacancy, which is, in fact, uniquely related to H/cU.[12] So our new wage equation is

$$w - p = \gamma_0 - \gamma_1(cu/s). \tag{2'}$$

In equilibrium, the more effective are the unemployed (i.e. the higher is c), the lower is unemployment.

But how are we to measure c over time? One approach might be to replace it by what determines it, including the replacement ratio B/W. But there are many other factors which also affect search effectiveness, including social attitudes to work, the stigma attaching to unemployment, employers' attitudes, and so on. These are very difficult to measure; but fortunately, there is some direct evidence on c from the behaviour of unemployment in relation to vacancies.

The unemployment–vacancy relationship

Given the small amount of information economists have about how their economies work, we need to exploit to the utmost the information that vacancy data provide. In particular, we can obtain direct evidence on the effectiveness of job search (c) by examining the movement of unemployment relative to the level of vacancies.

This is because there is a 'hiring' (or 'matching') function which explains the flow of unemployed people into work. This flow (H) depends positively on the number of vacancies (V) and also on the number of effective job-seekers (cU):

$$H = h(V,cU). \tag{9}$$

Provided the market is large enough, an equiproportional increase in vacancies and in effective job-seekers will induce an equiproportional increase in hirings. Hence the chances of finding a job are given by

$$\frac{H}{U} = ch\left(\frac{V}{cU},1\right). \tag{10}$$

Both (7) and (8) imply that, from knowledge of H, V, and U, we can infer changes in c.

Alternatively, we can use the fact that in equilibrium $H = sN$ to obtain the relationship

$$s = h\left(\frac{V}{N}, \frac{cU}{N}\right). \tag{10'}$$

This is the famous Beveridge curve (or U/V curve). For given s, shifts in this curve reflect shifts in c. As Fig. 11 shows, there has been a considerable increase in many European countries in the level of unemployment at given vacancies. (In the USA it shifted out but has now shifted back.) What could account for the outward shift of the European Beveridge curve?

From what we have said so far, the explanation would have to be a fall in search effectiveness (c) among the unemployed. However, there is another possible explanation to be considered. There could have been an increase in 'mismatch' between the pattern of unemployment and vacancies across sectors (i.e. regions, industries, or skill-groups). An increase in mismatch would shift out the U/V curve; for, provided the relation (10') between U/N and V/N in each sector is the same and convex to the origin, the

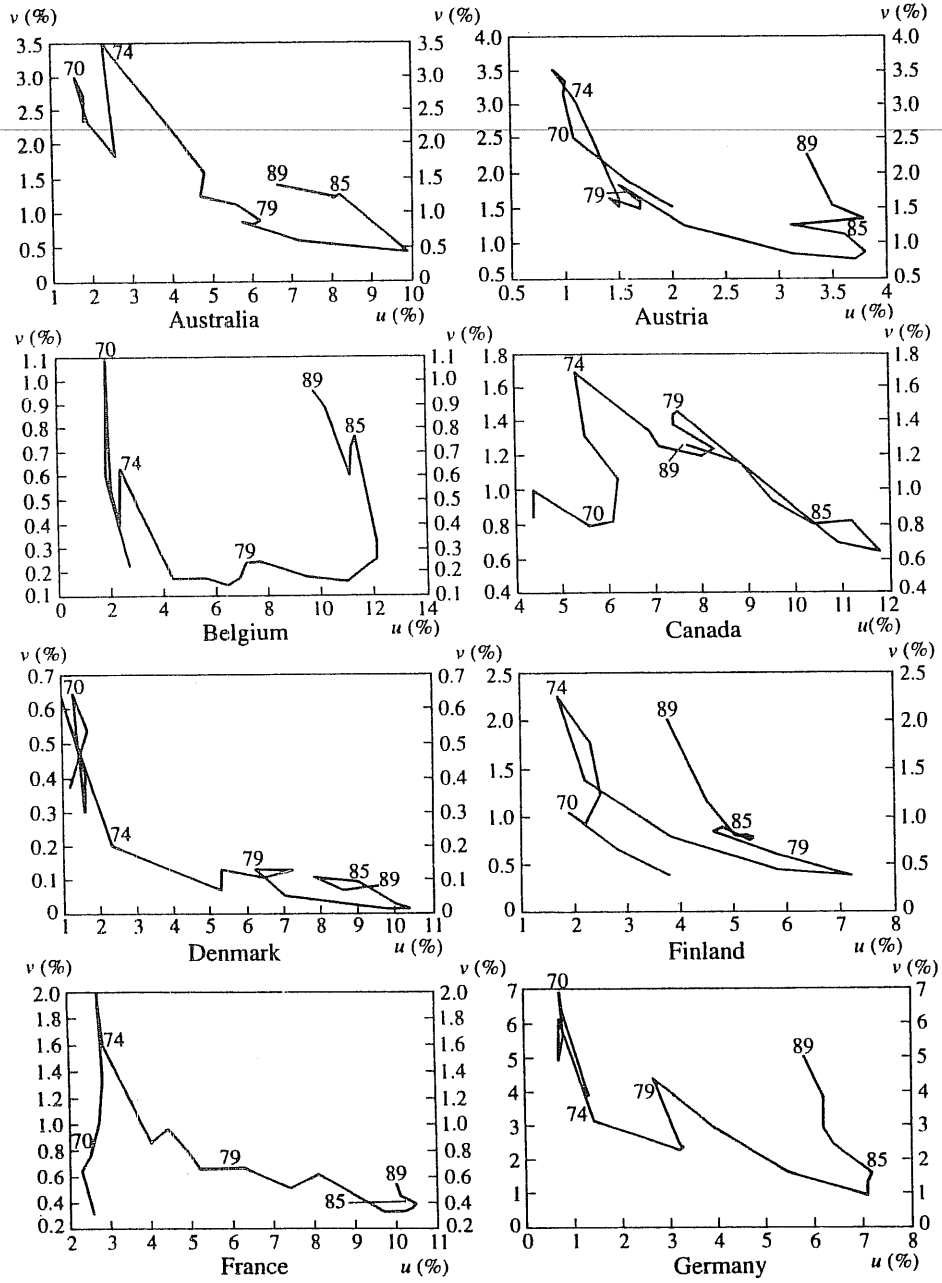


Fig. 11. *Vacancy rates* (v) *and unemployment rates* (u).
Source: Jackman *et al.* (1990).

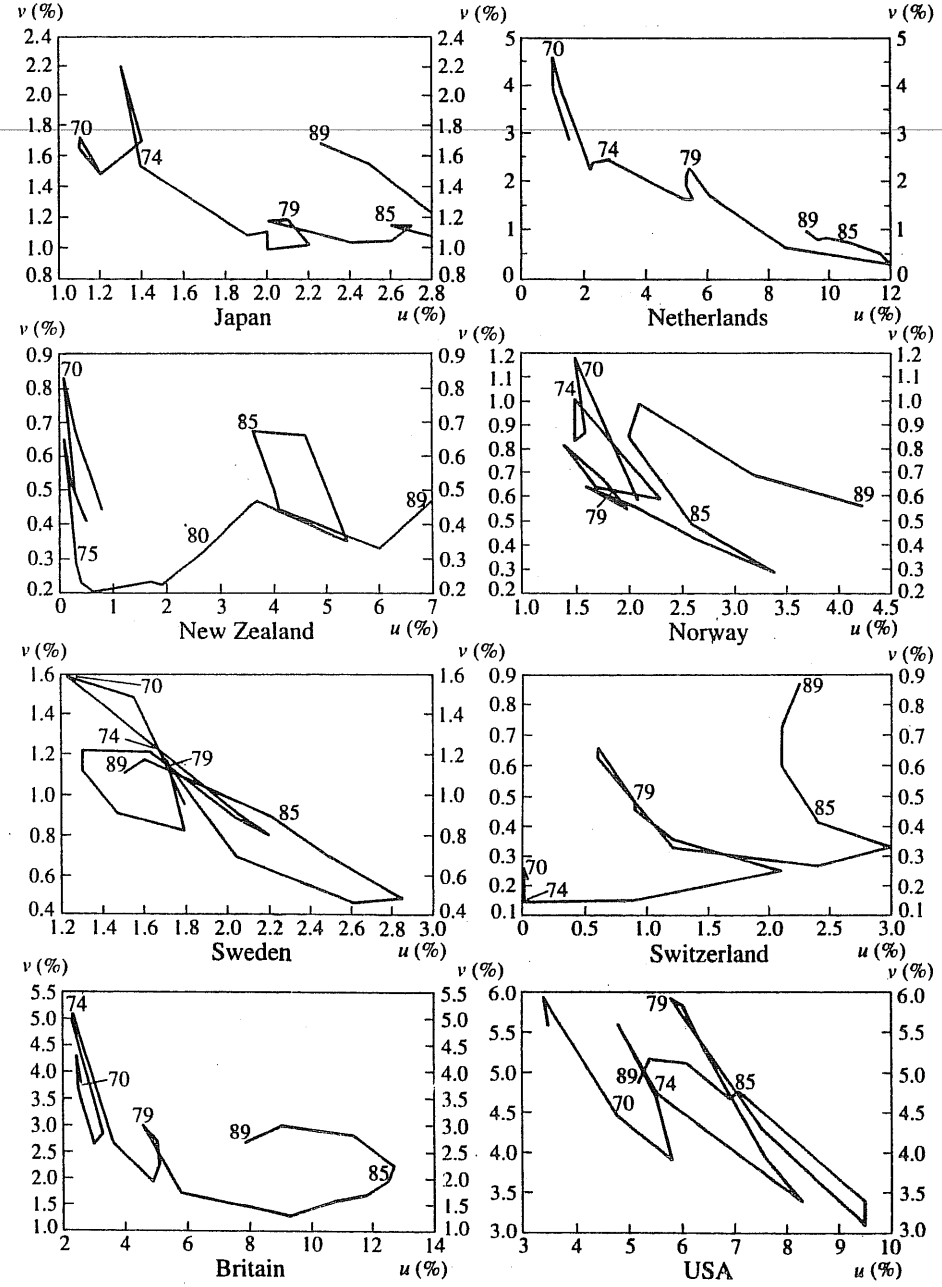


Fig. 11. (*cont.*)

aggregate curve will be 'further out' if U/V differs between sectors. However, if the relevant mismatch indices are computed, it turns out that they have not risen at all since the early 1970s in Britain or in most other European countries.

So we come back to search effectiveness. Either workers have become more choosy in taking jobs, or firms have become more choosy in filling vacancies (owing for example to discrimination against the long-term unemployed or to employment protection legislation). Both are possible, and we need to be very clear about this when we use our concept of effective job-seekers (cU). Effectiveness (c) reflects not only how hard the workers look for work, but also how willing the employers are to consider them.

Factors affecting job-finding

We can now identify two measurable factors that affect c and thus job-finding—see equation (10). The first is the *benefit–income (replacement) ratio*, whose effects have been much studied in Britain and the USA, using both cross-section and time-series data. The results typically suggest that the elasticity of exit rates from unemployment with respect to the replacement ratio are of the order of 0.2–0.9.

In most European countries, though not in the USA, replacement ratios rose significantly in the 1960s or 1970s or both (Emerson 1988). In Britain they rose by a half from the mid-1950s to the mid-1960s but not thereafter. This increase may have had some lagged effect on unemployment but can explain only a fraction of the increase in unemployment in the 1970s, and none of that thereafter. It is of course possible that the absolute real value of benefits also has an effect (e.g. that the relevant replacement ratio relates to incomes above some subsistence level). But this is pure speculation.

The second factor is *how long people have been unemployed*. The apparent effect of this can be seen in striking form by comparing the exit rates from unemployment of

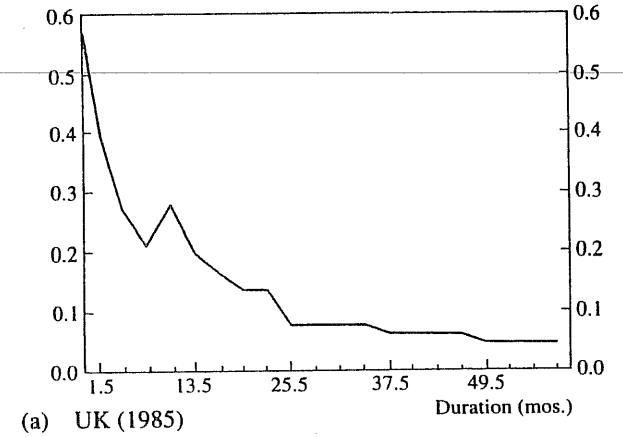
people with different durations. Fig. 12 shows this for both Britain and the USA. In the USA there are very few long-term unemployed. But in Britain, where there are many, the exit rates are much lower for the long-term unemployed. One reason for this must be that the more energetic job-seekers find jobs first, so that the long-term unemployed include a higher proportion of less energetic people. But time-series evidence makes it clear that another reason is the direct effect of unemployment duration upon a given individual. Long-term unemployment both demoralizes the individual and is also used by employers as a (biased) screening device. Thus, if the average duration of unemployment rises, we can expect the average level of c to fall. Hence unemployment will rise relative to vacancies.

The exact degree to which duration affects exit rates cannot easily be resolved from studies of individual data, owing to the problem of unobserved differences between individuals. But aggregate time-series equations indicate a considerable effect of duration structure upon average exit rates.

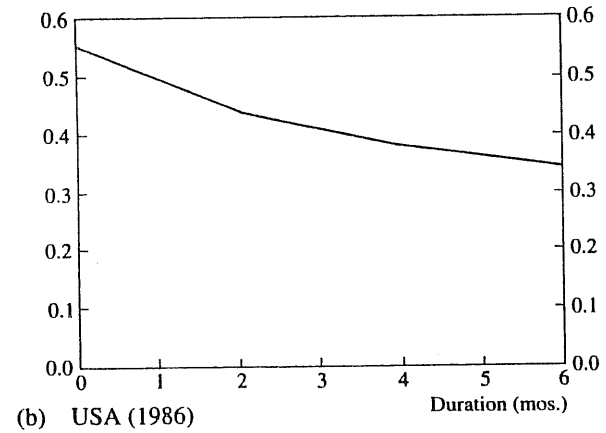
Moreover, in regressions of the unemployment rate on the vacancy rate and the proportion of long-term unemployed, the latter term has a significant positive effect. The same is true when the proportion of the long-term unemployed is included in a real wage equation: it increases wage pressure. In other words, the long-term unemployed are much less effective inflation-fighters, since they are not part of the effective labour supply.

Between 1979 and 1986, the proportion of unemployed who had been out of work for over a year rose from around 20 to around 40 per cent in Britain. Using the regression estimates, this in itself would explain one-third of the outward shift of the U/V curve. Similar findings apply in other major European countries.

It is noticeable in Fig. 13 that all the countries where long-term unemployment has escalated have unemployment benefits of some kind that are available for a very long period, rather than running out after 6 months (as in the



(a) UK (1985)



(b) USA (1986)

Fig. 12. *Proportion of unemployed people leaving unemployment within the next 3 months, by existing duration of unemployment.*

Sources: (*a*) This is based on the outflow rates between April and July 1985 for those with the indicated durations in April. All but one of these rates come from taking the stock of unemployed for duration d in April and comparing it with those unemployed for duration $d + 1$ in July (or, where the stock data cover two quarters, $d + 2$ in October or, for four-quarter categories, $d + 4$ in the following April). The very first outflow rate, for those who just became unemployed, is com-

cont. opposite/

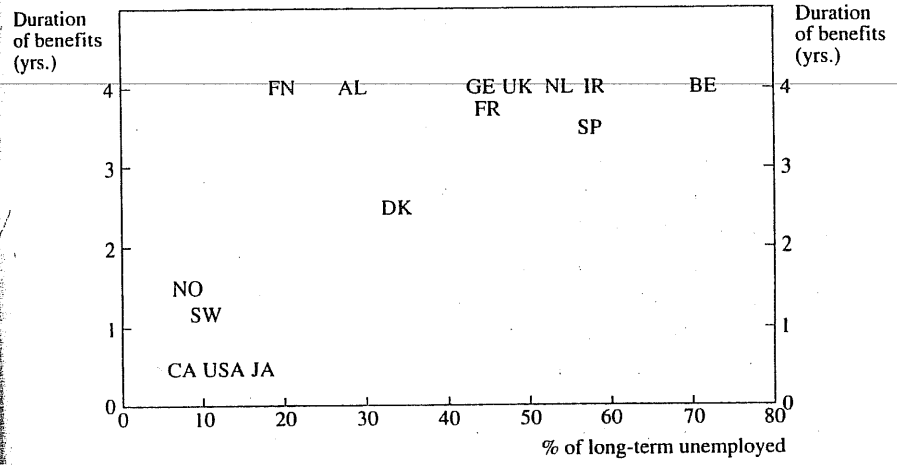


Fig. 13. *Maximum duration of benefit, 1985, and percentage of unemployed out of work for over a year, 1983–1988.*

Countries with indefinite benefits are graphed as having a 4-year duration.

AL: Australia; BE: Belgium; CA: Canada; DK: Denmark; FN: Finland; FR: France; GE: Germany; IR: Ireland; JA: Japan; NL: Netherlands; NO: Norway; SP: Spain; SW: Sweden; UK: United Kingdom; USA: United States.

Sources: proportion of long-term unemployed in total unemployed: OECD, *Employment Outlook*, July 1989 and July 1990, Table M; benefits: Table 5 below. Italy is omitted because it has no effective benefit system (see Annex 3, Table A1).

puted as

$$2\left(1 - \frac{\text{stock of the unemployed under 3 mos. in Apr.}}{\text{inflow, Jan.–Apr.}}\right).$$

This is based on the assumption that the outflow rate over the first three months is constant, so that by the end of a quarter the remaining stock excludes one-half of those who leave within the first three months of their unemployment.

(*b*): OECD, *Employment Outlook*, Sept. 1988, Table 2.12.

USA) or 14 months (as in Sweden). In countries in which benefits are indefinitely available, employment is much less likely to rebound after a major downwards shock.

If employment does not rebound quickly, further changes may occur affecting job search. An unemployment culture may develop, through the external effect of one man's unemployment on another man's job search. If no one in your street is out of work, the social pressure to find work is much greater than if (as sometimes happens in Britain) half the street has been out of work for some years. Mechanisms of this kind could help to explain the persistence of unemployment. Thus, if the recent history of unemployment affects the current (short-run) NAIRU, this is mainly because it affects the search effectiveness of the unemployed 'outsiders', rather than because it reduces the number of 'insiders' in work.

9

Is Unemployment Voluntary or Involuntary?

In the last section we showed how the search behaviour of individuals affects equilibrium unemployment. At any moment there are outstanding vacancies as well as job-seekers, but it takes time to match them to each other. In consequence, unemployment and vacancies coexist. The harder people look for work, the lower unemployment will be, because wage pressure will be reduced (at any given level of unemployment).

This raises the question of whether unemployment is voluntary or involuntary. The question is fruitless. There are two aspects to reality:

1. There *is* job rationing, because individuals cannot just pick up a job.
2. The total number of jobs *does* respond to how hard people search.

To get a proper perspective on unemployment, it is essential to hold both points in view.

However, there are two further qualifications to be made to this picture:

3. For the semi- and un-skilled, there are often in fact very few well paid vacancies. Those that appear are snapped up overnight, and there are often hundreds of applicants who are, for all practical purposes, indistinguishable.

Employers report no shortage of labour to do these jobs. In Britain the proportion of employers in manufacturing who expect their output to be limited by shortages of non-skilled labour has averaged only 5 per cent over the last quarter-century (compared with 19 per cent for skilled workers). Thus, there are not many well-paid vacancies for less skilled labour in what we may call the 'primary sector'. Once people get these jobs, they tend not to quit.

4. However, though well-paid jobs are scarce, it is generally possible to find a badly paid one. For most of the unemployed (other than the handicapped) there is some vacancy they can pick up—in catering, cleaning, some retail stores, and small-scale repairs and maintenance. For those with sufficient enterprise, there is also self-employment. This whole sector we may call the 'secondary sector' (though in fact there is clearly a continuous spectrum of jobs). The secondary sector is market-clearing, in the sense that wages are not high enough to attract a queue of job-seekers, nor do vacancies last long since skill requirements are low. *In the secondary sector, if wages were lower employment would fall, because of reduced supply of labour; whereas in the primary sector, if wages were lower employment would grow, because of increased demand.*

Why are there people who would be willing to work in the primary sector but not in the secondary sector? It may be because it is harder to find a primary-sector job while already employed in the secondary sector than while unemployed. Another possible reason is that for some people life on unemployment income is preferable to life in the secondary sector. People vary in these respects, and for each person i there is some critical secondary-sector wage (W_i^*) at which they are just willing to work. The array of reservation wages (W_i^*) taken in ascending order provides the rising supply curve of labour to the secondary sector. Once the secondary-sector wage is determined, we know how

many of those not employed in the primary sector will be employed in the secondary sector, and how many will be unemployed.

The primary and secondary sectors

We can illustrate the position in Fig. 14. The total labour force (employed plus unemployed) is L. We take this as exogenous, mainly on the grounds that the total labour force (male and female taken together) is not very responsive to changes in wages. All workers are willing to work in the primary sector. D_1 gives the demand relationship between primary employment and the primary-sector real wage (in units of general purchasing power). This wage is determined at the level shown, by the mechanism of efficiency wages or union bargaining already discussed. Thus, primary-sector employment is N_1. This leaves $L - N_1$ workers available for the secondary sector. We suppose that the distribution of reservation wages in this group is

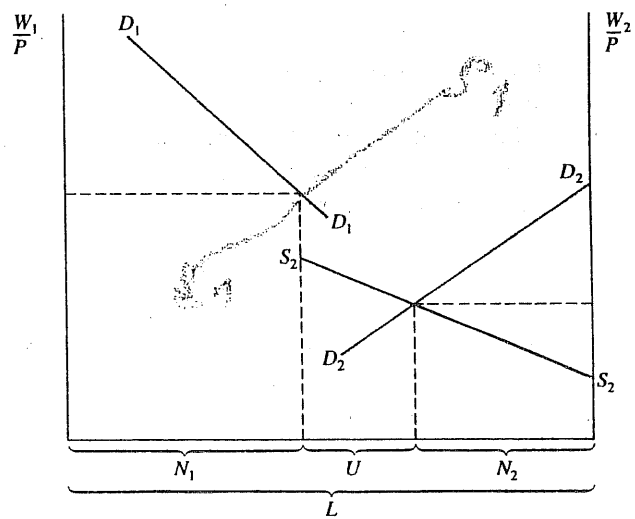


Fig. 14. *Unemployment in a two-sector model.*

independent of its size, with a minimum equal to the minimum height of S_2 and a maximum equal to its maximum height. D_2 gives the demand relationship between secondary employment and the secondary-sector real wage. In this sector the wage and employment are determined so that the market clears, with N_2 people being employed. This leaves $L - N_1 - N_2$ $(= U)$ people unemployed.

These people are both involuntarily and voluntarily unemployed. They are willing to work in the primary sector at the going wage there, but have not so far found work; they are *not* willing to work in the secondary sector at the going wage there.

This account seems to capture the way most participants (firms and workers) perceive the equilibrium of the labour market. As time proceeds, some primary-sector firms expand, others contract. Thus, some people lose jobs in the primary sector and join those $L - N_1$ people outside who would like jobs in the primary sector. Some of these become unemployed, while others take secondary-sector jobs while continuing to look for better work.

How long those who become unemployed remain so depends on the general equilibrium of the system. The key element is the number of primary-sector jobs, which in turn depends on the primary-sector wage. It is however extremely difficult to distinguish between the primary and secondary sector in the official statistics. The secondary sector is also a fairly small part of the manual labour market. We have discussed it because it is important to recognize the reality that for most people *some* job is available (especially of course for those with personal characteristics liked by employers).

But in order to understand how the economy changes over time, it may be good enough to proceed as though there were only one sector, whose wages and employment are determined by the kinds of mechanism discussed in Chapter 6.[13]

10

Why are Some Groups More Unemployed Than Others?

We have proceeded so far as though all workers were the same, except that some of them have jobs and others haven't. But in fact, unemployment rates differ sharply between groups. Why is this, and how do these disparities affect the overall unemployment rate?

Causes of mismatch

As we have stressed before, unemployment mainly affects manual workers. Over three-quarters of unemployed men are manual workers. As Table 3 shows, this is mainly because they are more likely to *become* unemployed, not because they remain unemployed for much longer once unemployed.

Similarly, young people are more likely to be unemployed than older people, and this is again due to the fact that they are more likely to become unemployed. In fact, they remain unemployed for a rather shorter time on average than older people.

So here we have big differences in unemployment between occupations and age-groups which are persistent over time and across countries. They are not mainly related to general shifts in demand or supply, or to any resulting market disequilibrium. They are essentially equilibrium phenomena.

Table 3 *Unemployment by skill: flow and duration, Britain and USA*

	Britain (1984)			*USA (1987)*		
	Inflow rate (% per mo.)	*Average duration (mos.)*	*Unemployment (%)*	*Inflow rate (% per mo.)*	*Average duration (mos.)*	*Unemployment (%)*
Professional and managerial	0.50	11.2	5.3	0.74	3.0	2.3
Clerical	0.88	10.1	8.0	1.58	2.6	4.3
Other non-manual	1.14	11.8	12.2			
Skilled manual	1.02	14.2	12.6	1.97	2.9	6.1
Personal services	1.32	14.1	15.5	2.96	2.4	7.7
Other manual				2.84	3.0	9.4
All	0.94	12.8	10.8	2.23	2.6	6.22

Notes:
Inflow rate = inflow/numbers employed
Outflow rate = outflow/numbers unemployed
Unemployment rate = numbers unemployed/numbers employed-or-unemployed

Monthly inflow and outflow are measured by numbers unemployed less than 1 month. In Britain the numbers in this category on the *Labour Force Survey* (*LFS*) definition of unemployment are only 70% of those in their first month of benefit receipt. The *General Household Survey* is broadly consistent with the *LFS*.

Source: *Britain: Labour Force Survey* tapes. This only records previous occupation and industry for those unemployed for under 3 years. The unemployment rate in each occupation is computed by taking the numbers unemployed for less than 3 years who were previously employed in the stated occupation and raising it by the ratio of total unemployed to numbers of unemployed reporting their previous occupation. A similar procedure is done for those unemployed for under 1 month. *USA: Employment and Earnings*, Jan. 1988, p. 175.

But they do result from *firm-level* disturbances, in which some firms are expanding and others are contracting. As firms are forced to contract, they lay off not their experienced non-manual staff, in whom they have sunk much firm-specific human capital, but their direct labour and to

some extent those workers most recently hired (last-in, first-out). In addition, younger workers are more prone to quit. So what we are seeing is a stochastic equilibrium, involving a persistent mismatch between the pattern of the labour force (L) and the pattern of employment (N). How such a mismatch affects the overall unemployment rate we shall consider in a moment.

But first we turn to regional unemployment differences. Here we come nearer to something with a disequilibrium (i.e. transitional) element in it. Certainly these differences are related to shifts in labour demand, and to a failure of migration to keep pace. For example, we can see how the decline of textiles caused unemployment in New England in the 1960s and 1970s, while at the same time Texas boomed; and in the 1980s there was a complete reversal, as high tech boomed and oil faltered. Similarly, in Germany the North boomed in the 1960s and unemployment was relatively high in Bavaria; by the 1980s the decline of heavy industry had completely reversed the situation.

But in other countries regional unemployment differentials are much more persistent, with unemployment always higher in the North of England and the South of Italy. The differences here are sustained by steady one-way shifts in the pattern of demand, with migration never catching up. It is a steady-state disequilibrium.

The main reason why labour demand shifts from one region to another is that labour demand shifts between industries, and different regions are intensive in different industries. Thus, the degree of regional imbalance is related to the rate of change in industrial structure. In Britain regional unemployment differences were much greater in the interwar period than since the war—and so were the changes in industrial structure. If we compute the proportion of jobs in each industry in adjacent years and then take the changes in each proportion, we can sum the positive changes to get a measure of the proportion of employment 'changing industries'. This measure averaged 2.7 in 1924–39 and less than half as much (1.1) since 1950. The

pattern for the USA is very similar (1.7 and 0.9). (The USA data relate to 1-digit and the British to 2-digit industries.)

But has turbulence increased since the 1960s in a way that could help to explain increased unemployment? The answer is a clear no. And for this reason, we are not surprised that the inflow into unemployment has not increased in most countries. The secular rise in unemployment is associated with increased duration and not with an increase in the rate of job loss.

Relation of mismatch to the NAIRU

The next issue is, How exactly do differences in unemployment rates affect average unemployment? In addressing this question, it is essential to banish the idea that the only interesting unemployment differences are those relating to disequilibrium problems of transitional adjustment. Even if age differences in unemployment reflect an equilibrium, it is still true that, by shifting labour demand from middle-aged to younger people, we could reduce the NAIRU. So we need a general framework for analysing the implications of unemployment disparities, from whatever source they may arise.

The basic idea is that if there are unemployment disparities, this makes it more difficult to secure a low average level of unemployment. For the low-unemployment labour markets overheat while there is still high unemployment elsewhere. If, instead, we could increase unemployment by x per cent where it is low, and reduce it by x per cent where it is high, this would reduce wage pressure. For wages are more sensitive to unemployment when unemployment is low than when it is high.

The problem can be analysed quite simply within our standard framework, and ignoring nominal inertia. Assuming for simplicity normal-cost pricing ($\beta_1 = 0$), the price equation can be approximated by

$$p = \beta_0 + \sum_{i=1}^{I} \alpha_i w_i \quad (\sum \alpha_i = 1),$$

where there are I types of labour having (log) wages, w_i. There are separate wage equations for each type of labour, which evidence suggests have the concave form

$$w_i - p = \gamma_{0i} - \gamma_1 \log u_i \qquad (i = 1, \ldots, I).$$

Substituting the wage equations into the price equation, and adding and subtracting $\gamma_1 \log u^*$, gives

$$\gamma_1 \left[\sum \alpha_i (\log u_i - \log u^*) + \log u^* \right] = \text{const.}$$

or[14]

$$\log u^* = -\sum \alpha_i \log(u_i/u^*) + \text{const.}$$

$$\simeq \frac{1}{2} \text{var} \frac{u_i}{u} + \text{const.}$$

Thus, the NAIRU depends on the variance of the relative unemployment rates. Hence equiproportional rises in unemployment rates do not increase the NAIRU. This is due to the curvature of the wage function, which empirically appears to be best represented by the double-log form.

We can now examine whether mismatch, measured in this way, has increased over time. Table 4 gives data for Britain on the variance of relative unemployment rates by occupation, age, region, and industry. There is no pattern of general increase since the mid-1970s. Similar results apply to regional and industrial patterns of unemployment in most of the main OECD countries. Though unemployment has risen, it has risen by much the same proportion in all groups—or, at least, its relative dispersion has not increased.

Turning to the shift in the U/V curve, this could be due to increased mismatch only if there were increased imbalance between the pattern of vacancies and unemployment. Imbalance of course exists, with vacancy rates low where unemployment rates are high. But there is no evidence in

any major country that the misalignment has increased since the early 1970s.

This does not mean that mismatch is unimportant. If we add up the different mismatch indices in Table 4 for 1985 (treating them as independent), they have raised unemployment by some 40 per cent (half of the sum of the bottom row) above what it would otherwise be. Thus, when we come to policy, mismatch is a major issue. It is just that this is nothing new.

Table 4 *Variance of relative unemployment rates, Britain, 1974–1985 (%)*

	By occupation (5 groups)	*By age (10 groups)*	*By travel-to-work area (322 areas)*	*By industry (10 groups)*
1974	23	16	18	11
1975	14	19	22	13
1984	21	14	20	12
1985	22	23	24	14

Source: *General Household Survey*. Travel-to-work area data are available only for 1985 but have been inferred for other years, using regional data.

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Why has Unemployment Differed Between Countries?

We are now ready to explain the differences in unemployment experience between countries. Table 1 shows the amazing spread of unemployment rates in 1990, and Table 5 gives similar data for 1983–8. Average unemployment was in 1990 roughly 9 per cent in the EC, 5½ per cent in the USA, 2 per cent in Japan, and 3 per cent in the EFTA countries. By contrast, in the 1960s the unemployment differences were small (in absolute terms): Britain, France, Germany, Belgium, the Netherlands, the EFTA countries, and Japan all had average unemployment below 2½ per cent; the USA had 4 per cent. Thus the challenge is to explain why the unemployment rates are now so different.

Static analysis

We shall begin with an extremely static approach to the issue, and then look more carefully at the different shocks that have affected different countries and how they have responded to them.

We began this chapter with the simplest possible Phillips curve (3"):

$$\Delta^2 p = -\theta_1(u - u^*).$$

Table 5 *Unemployment experience of different countries, and treatment of the unemployed*

	(1) Unemployment rate % 1983–8	*(2) % of long-term unemployed 1988*	*(3) Duration of unemployment benefit (yrs.) 1985*	*(4) Replacement ratio (%) 1985*	*(5) Expenditure on 'active' labour market programmes per unemployed person (as % of output per person) 1987*
Belgium	11.3	78	Indef.	60	7.4
Denmark	9.0	29	2.5	90	7.9
France	9.9	45	3.75	57	3.9
Germany	6.7	47	Indef.	63	10.4
Ireland	16.4	66	Indef.	50	5.0
Italy	7.0	69	0.5	2	0.8
Netherlands	10.6	50	Indef.	70	2.7
Portugal	7.7	51	0.5	60	7.4
Spain	19.8	62	3.5	80	2.1
UK	10.7	45	Indef.	36	4.6
Australia	8.4	28	Indef.	39	2.8
New Zealand	4.6	—	Indef.	38	13.1
Canada	9.9	7	0.5	60	4.3
USA	7.1	7	0.5	50	2.4
Japan	2.7	21	0.5	60	5.6
Austria	3.6	13	Indef.	60	11.3
Finland	5.1	19	Indef.	75	12.9
Norway	2.7	6	1.5	65	9.8
Sweden	2.2	8	1.2	80	34.6
Switzerland	2.4	—	1.0	70	3.7

Sources: col. (1): see Annex 6, UK is UK(1); col. (2): OECD, *Employment Outlook*, July 1990, Tables M and P; cols. (3) and (4): mainly US Department of Health and Social Services, *Social Security Programs Throughout the World 1985 (Reserve Report No. 60)*; see also OECD, *Employment Outlook*, Sept. 1988, Tables 4.3 and 4.4. Further details in Annex 3; col. (5): OECD, *Employment Outlook*, Sept. 1988, Table 3.1.

If we let u^* depend on a vector of institutional variables z, we can rewrite this as

$$u = a_0 + a_1 z - \frac{1}{\theta_1}\Delta^2 p$$

or, for the ith country,

$$u_i = a_0 + a_1 z_i - a_2 \Delta^2 p_i. \qquad (11)$$

We can then attempt to explain the average unemployment rate (1983–8) in each country by its current institutional structures (z), and the degree of disinflation ($-\Delta^2 p$).

On the basis of our analysis so far, we would expect the NAIRU to be affected by the following variables in the manner shown:

	Effect
Duration of unemployment benefits	+
Replacement ratio	+
Expenditure on national manpower policies	–
Union coverage	+
Co-ordinated bargaining by unions	–
Co-ordinated bargaining by employers	–

So the first task is to look at the basic institutional differences between countries, building up in Tables 5 and 6 a profile of national institutions which we then use to explain unemployment.

Unemployment benefits

Most EC countries except Italy have benefit systems that are more or less open-ended in duration—unemployed people can draw benefits for at least three years and often indefinitely. By contrast, in the USA and Japan the maximum is half a year and in Norway, Sweden, and Switzerland it is roughly a year. We give summary statistics for 1985 in column (3) of Table 5. In fact, all benefit systems are very

complicated (Atkinson and Micklewright 1991). In Annex 3, Table A1, we show exactly which benefits we are counting (i.e. all those paying over $120 a month in 1985).

There is also the question of the replacement ratio. In column (4) we give the replacement ratio over the initial period of unemployment for a single man under 50. This shows gross benefits as a percentage of the most relevant gross wage. As the table shows, replacement ratios are very high in EFTA countries and Denmark and Spain, but the duration is generally limited. In most other countries they are around 50–60 per cent, except for the UK, Australia, and New Zealand, where they are rather lower.

There are two other key dimensions of benefit systems, which are not shown in the table. The first is their coverage—most usefully thought of as the proportion of the unemployed receiving benefit. Table A2 of Annex 3 gives some partial information on this, together with the actual outlays on benefit. Coverage is between a half and three-quarters in most European countries. In the USA it is only a third and in Japan 40 per cent.

The other key issue is the conditions for getting benefit. Such matters are extremely subtle but very important. For example, in Britain virtually no test of work availability was applied in the late 1970s and early 1980s. But from 1986 onwards people receiving unemployment benefit have been interviewed every six months under the Restart Programme and urged to find work. Fewer and fewer reasons are accepted for not taking up available jobs. A strict test of availability for work is also applied to newly unemployed people claiming benefit.

The dramatic fall in British unemployment after 1986 was partially due to these measures, which increased the effective labour supply so that, when demand surged ahead, there was only a limited increase in wage inflation. Corroborating evidence for this interpretation includes the facts that (1) vacancies did not rise despite the fall in unemployment (see Fig. 11); (2) productivity per worker grew at only 1 per cent a year at the peak of the boom; (3) semi- and un-skilled employment grew strongly; and (4) lower decile earnings fell sharply relative to the mean.

Unfortunately, there are no internationally comparable measures of administrative procedures between countries. But there is a widespread impression in Europe that the 'work test' was applied with progressively less rigour up to the early 1980s, and with rather more rigour since then. And some countries have always been tougher than others. For example, ever since the late 1930s Sweden has consciously adopted what it calls the 'employment principle' as opposed to the 'benefit principle'. This means that unemployed people are expected to look hard for work and, if necessary, to move to get it. In return, they are given major help with job search and in other ways.

Active labour market policy

In fact, countries differ sharply in the amount of 'active' help they give to the unemployed, and not only in the 'passive' help they give through unemployment benefits. Countries vary enormously in what they spend on (*a*) placement and counselling services (plus administration), (*b*) training of adult unemployed, and (*c*) direct job creation and recruitment subsidies. Since the programmes vary with the unemployment situation, the best way to measure a country's commitment to this activity is to measure expenditure per unemployed person (relative to output per worker). As Table 5, column (5) shows, the degree of commitment varies amazingly, with the Swedes doing much more than any other country and Germany doing more than any other EC country. In fact, Sweden goes to the length of guaranteeing every unemployed person a temporary job if he or she has still not found a job when benefits run out (after 14 months).

Table 6 *Collective bargaining in different countries*

	(1) % of workers covered (3 = over 75% 2 = 25–75% 1 = under 25%)	(2) Union coordination (3 = high 2 = middle 1 = low)	(3) Employer coordination (3 = high 2 = middle 1 = low)	(4) Workers involved in strikes p.a. (per 100 workers) (1980s)	(5) Working days lost p.a. (per 100 workers) (1980s)	(6) Wage contract flexibility (index)	(7) Change in inflation 1983–88 (% points)
Belgium	3	2	2	—	—	4	–3.6
Denmark	3	3	3	4.8	21.9	6	–3.0
France	3	2	2	0.8	6.3	3	–6.5
Germany	3	2	3	0.7	3.5	4	–1.7
Ireland	3	1	1	4.5	43.5	2	–7.6
Italy	3	2	1	36.3	72.0	4	–8.9
Netherlands	3	2	2	0.5	1.4	5	–0.1
Portugal	3	2	2				–12.7
Spain	3	2	1	15.0	60.5	1	–5.8
UK	3	1	1	4.6	37.8	2	1.4
Australia	3	2	1	11.5	37.5	6	1.1
New Zealand	2	2	1	11.6	47.1	6	1.4
Canada	2	1	1	3.3	56.7	2	–1.8
USA	1	1	1	0.5	12.5	1	–0.5
Japan	2	2	2	0.4	0.5	4	–0.3
Austria	3	3	3	0.3	—	4	–1.9
Finland	3	3	3	15.2	50.0	3	–1.6
Norway	3	3	3	0.7	10.8	4	–3.5
Sweden	3	3	3	2.9	18.5	4	–3.8
Switzerland	2	1	3	0.02	—	0	–0.3

Source: cols. (1)–(3): see Annex 4; cols. (4)–(5): *ILO Yearbook of Labor Statistics*; col. (6): Bruno and Sachs (1985: Table 11.7) with minor adjustments; col. (7): OECD, GDP deflator. See Annex 6.

Unions and wage bargaining

As we know, unemployment depends not only on the treatment of the unemployed outsiders, but also on the institutions through which wages are determined, and on how far these are dominated by insider power. In Europe unions are pervasive in wage-setting, and the percentage of workers unionized rose in most countries up to 1980, since when it has fallen in a few, especially Britain. Union membership is higher in EFTA than in the EC, but in most European countries over three-quarters of workers have wages that are covered by a collective agreement. This is shown in column (1) of Table 6.

But what matters about unions is not only whether they exist, but how centralized they are and thus who is represented in the typical union bargain. In the Nordic countries and Austria the unions operate in a highly centralized way with multi-industry national agreements. In the EC the basic system is for single-industry agreements, which are generally binding on all firms, whether they are unionized or not; however, employers may pay wages above what the industry agreement requires. So it is important whether firm-level strikes over wages are allowed. In Scandinavia, Germany, the Netherlands, and Portugal, they are not.

Within the EC there are big differences between countries in the degree of inter-industry co-ordination that occurs before the industry bargains begin. In Germany, for example, there is a major debate over what 'going rate' makes sense, which runs both in public and in private between the employers' and trade union federations. This leads to a pattern settlement in one industry (in one region) which is then broadly followed elsewhere. Britain is one of the least co-ordinated countries in the EC, with industry-level bargains being of minor importance and little discussion about the going rate. The system in Switzerland is also decentralized but with some employer co-ordination, and with industry-wide peace agreements outlawing firm-level strikes.

Australia and New Zealand have generally had centralized quasi-judicial setting of basic wages, modified by firm-level bargaining about 'over-award' payments. In Japan, wages in large firms are set by synchronized firm-level bargains (preceded by much general discussion), but there is also a large small-firm sector where wages are set by the employer. Finally, in Canada and the USA bargains are at firm level, but the majority of wages in the economy are set at the employer's discretion.

The systems are described in more detail in Annex 4. We need to classify them in a simple way that is yet the most relevant to explaining wage pressure. As we have seen, where union coverage is high, the key issue is whether unions bargain at the national level (thus taking into account the common interests of the workforce in full employment) rather than bargaining as atomistic groups of insiders (thus ignoring the effects of their actions on the general job situation or on the general price level). Of course, even where bargaining is not centralized, if the separate unions agreed on a common wage claim, this would have a similar effect.

But equally, or more, important is the employers' response. If they adopt a common position, then they will certainly not wish to concede real wages high enough to imperil full employment and thus profits. On the other hand, if they bargain one by one they will be more inclined to leapfrog each other, thinking they can achieve some efficiency wage advantage while passing on the cost in an increase of their relative prices. Thus, employer co-ordination could be even more important than union co-ordination.

We therefore construct in Table 6 crude indices of the levels at which unions co-ordinate their wage claims and employers co-ordinate their wage offers: 3 means essentially at national level, 2 at intermediate level and 1 at firm level (i.e. unco-ordinated).

Next, the table records, for interest, two measures of strike activity in the 1980s. Most of the differences are long-standing, reaching back to the Second World War, except for France, where the relative strike record has improved. Strikes are not of course a structural variable, and we shall not use them for explanatory purposes. But it gives some idea of the remarkable differences in industrial relations between countries.

Finally, there is the question of contract structure, which affects the degree of nominal inertia in an economy. If wage contracts are long, then, when nominal demand changes, current wages respond little, and unemployment changes a lot. This effect is reduced if wages are indexed, and it is also reduced if contracts are synchronized rather than overlapping. So we need an index of the extent to which contracts are flexible in the sense of being (*a*) short, (*b*) indexed, and (*c*) synchronized. If we award marks of between 0 and 2 on

each of these points and then add, we have an index of contract flexibility, as shown in column (6).

Explaining cross-section differences

We can now estimate equation (11) as a cross-sectional equation for the percentage unemployment rate 1983–8 in each of 20 countries. The results are as follows (with *t*-statistics in brackets):

Unemployment rate (%)
= 0.24(0.1)
+ 0.92(2.9) benefit duration (years)
+ 0.17(7.1) replacement ratio (%)
− 0.13(2.3) active labour market spending (%)
+ 2.45(2.4) coverage of collective bargaining (1–3)
− 1.42(2.0) union co-ordination (1–3)
− 4.28(2.9) employer co-ordination (1–3)
− 0.35(2.8) change in inflation (% points)
$\bar{R}^2 = 0.91$; s.e. = 1.41; $N = 20$

Thus, with six institutional variables plus the change in inflation, we can explain over 90 per cent of the differences in unemployment between countries.

As one would expect, the duration of benefit is important (we treated 'indefinite' as four years), and so is the replacement ratio. But it also helps if countries train their unemployed and take active steps to induce or provide work for them. On the bargaining side, high coverage of collective bargaining is bad for employment unless it is accompanied by co-ordinated bargaining. Co-ordination among employers is particularly important. If there is the maximum co-ordination, as in Scandinavia, a fully covered country can have lower unemployment than a country with very low coverage, where efficiency wage considerations may induce employers to leapfrog.

As it happens, the standardized regression coefficients are

all about one-tenth of the *t*-statistics quoted above. So the *t*-statistics indicate well the partial contribution of the different variables to explaining the unemployment differences. These differences are thus explained in roughly equal measure by the treatment of the unemployed, and by the bargaining structures.

Dynamic analysis

But this analysis does not explain why unemployment has changed over time, or why its movement has differed between countries. There are two key points here.

1. Unemployment has moved over time because of supply shocks (changes in γ_0, including now changes in real import prices) and demand shocks (changes in $\Delta^2 m$, the rate of nominal income growth). The extent of these shocks differs between countries.
2. The effect of any given shock depends on the country-specific parameters of the wage and price equations, which in turn depend on the institutional structure of the country.

Real and nominal wage rigidity

We begin with the second of these points. For this purpose we need to modify slightly our initial wage and price equations to allow for the fact that nominal inertia differs between countries. For example, where there are long-term, staggered wage contracts with no indexation, changes in inflation will have a much bigger effect on the mark-up of wages over prices. Thus the wage equation becomes

$$w - p = \gamma_0 - \gamma_1 u - \gamma_2 \Delta^2 p,$$

with a high γ_2 indicating a high level of nominal inertia or nominal rigidity. Similarly, the price equation will be

$$p - w = \beta_0 - \beta_1 u - \beta_2 \Delta^2 p.$$