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The Causes and Consequences of Long-Term Unemployment in Europe

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Abstract

One of the most striking features of European labour markets is the high incidence of long-term unemployment. In this paper we review the literature on its causes and consequences. Our main conclusions are that:

- the rise in the incidence of long-term unemployment has been 'caused' by a collapse of outflow rates at all durations of unemployment
- while the long-term unemployed do leave unemployment at a slower rate than the short-term unemployed, this has always been the case and their relative outflow rate has not fallen over time
- there is no evidence that, for a given level of unemployment, the incidence of long-term unemployment has been ratcheting up over time
- once one controls for heterogeneity of the unemployed, there is little evidence of outflow rates that decline over a spell of unemployment

While these findings suggest that long-term unemployment is not a problem independent of unemployment itself, one should recognise that the experience of long-term unemployment is a horrid one for those unfortunate enough to experience it.

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The Causes and Consequences of Long-Term Unemployment in Europe

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Introduction

One of the distinctive features of many current European labour markets is the high proportion of the unemployed who have been unemployed for a long period of time. Table 1 presents some recent data on the proportion of the unemployed who have been unemployed more than 6 and 12 months, the measures of the incidence of long-term unemployment most commonly used. This feature of European labour markets is widely regarded as a serious problem and has attracted a lot of attention. There are both efficiency and equity reasons for this concern.

First, long-term unemployment (LTU) is felt to have disastrous effects on the individuals who suffer it both in terms of their labour market opportunities and their more general physical and mental well-being. To the extent that high LTU means that unemployment is disproportionately concentrated on a few individuals it will also be a potent cause of income inequality given that a lack of work is the most important cause of poverty among households of working age in most European countries. Secondly, it has been argued that the long-term unemployed become detached from the labour market and play little role in competing for jobs. This makes them less effective in reducing wage pressure thereby causing a rise in the overall unemployment rate. Thus, high long-term unemployment has been argued to be a cause of high unemployment itself. Table 1 also reports the OECD standardised rate of unemployment. It can readily be seen (Figure 1) that there is a positive correlation between long-term unemployment and the overall unemployment rate though we will argue below that it is exceedingly dangerous to interpret this correlation as evidence of causality running from long-term unemployment to the level of unemployment.

In this paper we critically review the literature on what determines the duration structure of unemployment and on the consequences of high long-term unemployment. We are not going to attempt to explain the overall level of unemployment as that would be a book in itself. Wherever we arrive at a point in our analysis which requires an explanation of the level of unemployment we will stop and refer the reader to the excellent surveys on the subject (e.g. Layard, Nickell and Jackman, 1991; Bean, 1994) and the papers referenced in them.

The plan of this paper is as follows. In the next section we paint a picture of the pattern of long-term unemployment: how it varies across countries, how it has varied over time within countries and how it varies across demographic groups within countries. We then move on to present a simple framework for thinking about the determinants of LTU in terms of unemployment inflow and outflow rates. We argue that, in crude terms, one can think of the LTU proportion as being determined by the average exit rate from unemployment, the exit rate of the long-term unemployed relative to the short-term unemployed (the degree of duration dependence to use more technical language), and variations in the inflow rate into unemployment. We then attempt to establish whether differences in LTU can be explained by these different factors. We then consider each of them in turn. Our main conclusion from this is that the increase in the incidence of LTU and high unemployment rates have had a common cause: the collapse of exit rates from unemployment at all durations. While the long-term unemployed are less likely to leave unemployment than the short-term unemployed, this has always been the case and there is little evidence that this disadvantage has worsened over time. We then discuss the determinants of the average exit rate from unemployment and duration dependence.

The next section discusses the consequences of long-term unemployment. We consider the arguments and empirical evidence that high LTU weakens the impact of unemployment on wage pressure and contributes to the persistence of shocks. We also review the evidence on the consequences for the individual in terms of their physical and mental well-being, and we attempt to evaluate the extent to which high LTU is associated with inequality in the distribution of unemployment. Finally we conclude by discussing the arguments for and against policies targeted at improving the employment prospects of the LTU.

1. A Picture of Long-Term Unemployment

1.1 Data on Long-Term Unemployment

Before we start looking at the numbers, it is worthwhile discussing the most common sources of the information we will analyse and the summary statistics on the incidence of LTU that we will use. As with most statistics on unemployment, there are two main sources of information on the duration of unemployment: survey-based and administrative measures.

All countries have some administrative means of registering individuals as unemployed, normally connected with the social security system or public employment agencies. These administrative records can then be used to provide information on the length of spells of unemployment as defined in this way. Although this information is readily available for a long period of time for many countries it has well-known problems. It is sensitive to details of the administrative system making comparisons across countries very difficult and comparisons over time within countries difficult if there is a substantial change in the administrative arrangements.

To give some idea of the potential problems caused by the idiosyncrasies of the system in different countries, Belgium does not regard sickness or employment of less than two weeks duration as constituting a break in an unemployment spell while Denmark would (Walsh, 1983). In addition Denmark, being a very civilised country, allows its unemployed up to a three-week vacation in the first year after job loss at the end of which they are classified as newly unemployed: Jensen and Westergard-Nielsen (1988) estimate that not regarding this vacation as a break in unemployment would raise the average duration of completed spells by something like 50%. In spite of these problems administrative information is often the only available for the analysis of longer-run trends and we will use it extensively.

Given these problems associated with administrative data there has been a move towards more widespread use of survey-based measures of unemployment. The Labour Force Surveys (or equivalent) of most countries ask questions which are designed to find out how long the unemployed have been in that state. Considerable effort has gone into providing a consistent approach to labelling the current labour market state of individuals as unemployed (the ILO definition of unemployment which is used to produce the OECD standardised unemployment rates) and there has been some attempt to ensure that the data on the duration of unemployment are similarly comparable. Typically those who are currently looking for work are asked how long they have been searching for work. There is obviously no way to check the validity of the answer to this question and given that we know that individuals' recall of length of spells has considerable measurement error as short spells are often forgotten and there is considerable rounding in answers, we would expect the responses to have considerable measurement error (see, for example, Torelli and Trivellato, 1993a,b). Individuals can also quite validly include periods of employment in their answer to this question as long as they were searching for work while in employment (though it is unclear whether this is a serious problem).

Table 1 presents a comparison of administrative and survey-based measures of the incidence of long-term unemployment.[1] The ranking of countries by the incidence of LTU unemployment is very similar according to the two types of measure. As the administrative measure is almost certainly affected by institutional idiosyncrasies this would suggest that the way that individuals answer the question on the duration of unemployment is probably also influenced by the institutions.

The statistics on the incidence of LTU that we have presented so far and that we will use for the most part in what follows are statistics on the fraction of the currently unemployed who have been unemployed for more than a certain period of time (i.e. it is based on information about the duration structure of incomplete spells). Typically that period of time is a year though in the past when LTU was less widespread 6 months was more commonly used and sometimes a period of more than two years is used (what is sometimes termed very long-term unemployment — see European Commission, 1988). These statistics dominate analysis of LTU more because they are widely and readily available than because they are particularly good measures of the underlying concept that we would like the statistic to measure. They do suffer from some weaknesses, notably that a single day out of unemployment will reset the clock for the duration of unemployment back to zero so that these statistics are very sensitive to short breaks in unemployment. There are other statistics that are less sensitive to this type of problem (e.g. the fraction of a year that an individual spends unemployed and which might be better measures of concepts like the inequality in the distribution of unemployment). This information is available in some cases and we will refer to it but it does not exist for most of countries and, where it is available, it has to be calculated from survey-based data.

Our discussion so far has been in terms of the duration of unemployment. But in many countries there has also been a sharp increase in inactivity rates in demographic groups that previously had a very strong labour market attachment (e.g. prime-aged men). This has led some researchers to alter their focus from unemployment to non-employment. One could obviously then produce a similar analysis based on duration of spells of non-employment. While this is a potentially fruitful line for further research we are not going to discuss it much here as little has been done as of now outside the US where, for example, Juhn, Murphy and Topel (1991) document that the rise over the period 1967-89 in the incidence of long-term non-employment is much more marked than any trends in long-term unemployment.

1.2 Variation Across Countries

We have already examined the cross-section pattern in the incidence of LTU at the current time. Figure 1 shows the relationship between the incidence of LTU and the overall unemployment rate for the OECD countries. As we have already observed, there is a positive relationship between the two variables but some countries are noted outliers. In particular, the North American countries seem to have very low levels of LTU given their unemployment rate as do Sweden and Finland. This variation has been one of the main facts that researchers in this area have tried to explain and we will review this literature below.

1.3 Variation Over Time

Figure 2 presents information on the variation in the incidence of LTU over time. For the most part

1. See Junankar and Kapuscinski (1991) for a more thorough analysis of the differences between the administrative and survey-based data for Australia.

this data come from administrative sources so one should be particularly careful in interpreting it. But, the most important fact is very clear. As the level of unemployment itself has risen so has the incidence of LTU. For the most part the cross-country variation in the incidence of LTU has been very stable through time (e.g. although the US had higher overall rates of unemployment than Europe in the 1960s, the incidence of LTU was always lower).

One might also be interested in whether the emergence of substantial levels of LTU is a uniquely post-war phenomenon. Understandably data from earlier periods is sparse and often based on very different sources but it can give some indication. The period in which the problem of LTU probably first attracted attention was the Great Depression of the 1930s, when the level of LTU unemployment was widely perceived as a new and particular problem (e.g. see Bakke (1933) and the Pilgrim Trust (1938) for accounts of the plight of the LTU in England at that period). Table 2 presents some information on the incidence of LTU at that time.

There is also some information from a still earlier period. James (1995) compares Massachusetts in 1885 with the US in 1974 concluding that long spells of unemployment were less important in the earlier period even though the overall level of unemployment was similar. Margo (1990) uses data from the 1910 US census to show that workers then had higher flows both into and out of unemployment, something which is probably also true of the labour markets in developing countries today.[2]

1.4 Variation Within Countries

There are also systematic patterns in the incidence of LTU within countries. Table 3 presents differences between men and women, by age and by educational attainment.

In most countries the incidence of LTU is lower for women than men though the gap is often quite small and there are a few countries where the incidence is higher for women than men. There are a number of possible reasons for these differences. Firstly, countries differ in the relative unemployment rates of men and women: it is noticeable that countries where the female unemployment rate is relatively high tend to have relatively high levels of incidence of LTU among women. Secondly, it is likely that the attachment of women to the labour force is also important: a higher proportion of women than men leaving unemployment are leaving the labour force rather than entering employment. If many women leave unemployment for inactivity then this will tend to lead to a low incidence of LTU even if the exit rate into employment is low.

In all countries there is a higher incidence of LTU among older workers and a lower rate among young workers. It is well-known that the labour market histories of young workers are often characterised by frequent movements between employment and unemployment which means that long spells of unemployment (and employment) are relatively rare.

Differences in the incidence of LTU by education are less marked. Most countries seem to have a higher incidence among the less-educated but the differences are often small. The most likely explanation for this is that, while unemployment rates are decreasing in educational attainment for most countries (e.g. see Nickell and Bell, 1995) this is often more because the inflow rate into unemployment is lower rather than because of any very marked differences in duration (e.g. see Mincer, 1991).

Other studies have found that certain groups of individuals — for example, those with health problems and ethnic minorities — are also relatively likely to be LTU. Generally it would seem that groups with the high unemployment rates also tend to have a high incidence of LTU, the

2. It should also be noted that LTU is emerging as a serious problem in the countries of Eastern Europe (see Boeri, 1996) though we will not discuss this here.

main exception to this being the young.

In this section we have described the main patterns in the incidence of LTU. Generally LTU emerges as a problem wherever unemployment is a serious a problem.[3] This raises obvious questions about the explanation for this correlation and we will try to answer those questions below. But there is also variation in the incidence of LTU which does not seem capable of being explained simply by the overall level of unemployment, most notably the fact that some countries seem to be much more vulnerable than others: we will try to explain this as well.

2. A Framework for Thinking about the Causes of Long-Term Unemployment

2.1 The Analytics of the Incidence of LTU

As in much work on the duration of unemployment, we will start from the outflow rate (or, to use more technical language, the hazard rate), the instantaneous rate at which individuals leave unemployment and express all functions in which we are interested in terms of it. This starting-point is arbitrary (one could equally well start with the distribution of complete or incomplete unemployment durations) but is convenient. Suppose that the outflow rate at duration t is given by h(t). The outflow rate could be allowed to depend on certain observable characteristics but we suppress this for the moment in the interests of simplicity. The outflow function h(t) should be interpreted as a 'reduced form' after we have integrated out any individual unobserved heterogeneity and can also be thought to represent the exit rate from unemployment to any other state, not necessarily employment: we will return to these issues below. If the outflow rate depends on duration then it is said to exhibit duration dependence: negative duration dependence if it falls with duration, positive if it rises.

It is well-known (see Lancaster, 1990, or Devine and Kiefer, 1991) that one can derive the distribution function G(t) of completed spells of unemployment from the outflow function according to the formula:

$$1 \& G(t) \quad ' \quad e^{\&\int_0^t h(s)ds} \qquad \textbf{(1)}$$

and the density function for completed spells g(t) can obviously be straightforwardly derived from this. The function [1-G(t)] is often referred to as the survivor function as it is the fraction of individuals entering unemployment who remain unemployed after a certain period of time t. Another way of representing the relationship between G(t) and the outflow rate is to note that one can write:

$$h(t) \quad ' \quad \frac{g(t)}{1\&G(t)} \quad ' \quad \&\frac{\partial \ln[1\&G(t)]}{\partial t} \qquad \textbf{(2)}$$

3. For example the first paper on the subject for the post-war period that we have found (Simler, 1964) is motivated by a concern about the rise in unemployment (though, with hindsight, this rise was very modest).

[1-G(t)] is the fraction of individuals left in unemployment after duration t and g(t) can be thought of as proportional to the fraction of workers who leave unemployment at some small time interval around t so that the outflow rate is the fraction of the 'at risk' group who leave unemployment at instant t.

The statistics on the incidence of LTU that we have described above are not based on the distribution of the duration of completed spells of unemployment but the current duration of incomplete spells. However, there is a simple relationship between the distribution of spell lengths among the currently unemployed and the distribution of spell lengths among the flow into unemployment and hence the outflow rate.

Let us start by deriving this relationship in a steady-state where the inflow into unemployment is constant at N and the outflow rates out of unemployment are also constant. The people who are unemployed with duration t today entered unemployment t periods ago and have not found a job since then. There are N[1-G(t)] of these people. Hence the proportion of people unemployed for more than t, P(t), is given by:

$$P(t) \;=\; \frac{\int_t^{\infty}[1-G(s)]\,ds}{\int_0^{\infty}[1-G(s)]\,ds} \qquad \textbf{(3)}$$

It should be apparent that this statistic is affected by outflow rates at all unemployment durations. But, how exactly do outflow rates affect P(t)? The answer is in the following result.

Result 1: The impact of outflow rates on P(t) is given by:

$$\frac{\partial \ln P(t)}{\partial h(s)} \;=\; P(s) - 1 < 0 \qquad \text{for } s<t$$

$$\frac{\partial \ln P(t)}{\partial h(s)} \;=\; P(s)\left(\frac{P(t)-1}{P(t)}\right) < 0 \qquad \text{for } s \geq t \qquad \textbf{(4)}$$

Proof: See Appendix.

The most important implication of Result 1 is that a fall in the outflow rate at **any** duration will tend to raise the incidence of LTU (a point made by Haskel and Jackman, 1988). In reading the literature on LTU one sometimes gets the impression that a high incidence of LTU is evidence of a particular problem with exit rates from unemployment for the LTU: that may or may not be the case (we will consider this issue below) but such a conclusion is simply unwarranted from a simple examination of the incidence of LTU without further analysis.

In fact, it is not even true that the incidence of LTU is most sensitive to changes in the outflow rate for the LTU. The impact of the outflow rate on the proportion LTU is illustrated graphically in Figure 3. The effect is largest for changes in the outflow rate at duration t and then falls away to nothing at zero and infinite durations. It should be apparent from this that one should be very cautious in concluding from comparisons of the incidence of LTU at different periods or in different countries that there is a particular problem facing the LTU where the incidence of LTU

is highest: it could simply be that the exit rate from unemployment is lower at all durations[4].

A crude way of summarizing this result would be to say that the proportion LTU is decreasing in the average exit rate from unemployment. But it should also be apparent that how the outflow rate varies with duration i.e. the nature of duration dependence also affects the proportion LTU. To illustrate this let us consider the impact of an increase in negative duration dependence. To compare like with like let us assume that the average exit rate from unemployment is constant so that we are considering, in some sense, a pure change in duration dependence. Let us assume that there is a variable z which alters the outflow function so that we can write the outflow function as h(t,z), the corresponding distribution function of completed spells as G(t,z) and the density function as g(t,z). Note that the average exit rate from unemployment among the current stock will be given by:

$$\frac{\int h(t,z)[1-G(t,z)]dt}{\int [1-G(t,z)]dt} \equiv \frac{\int g(t,z)dt}{\int [1-G(t,z)]dt} \equiv \frac{1}{\int [1-G(t,z)]dt} \equiv \frac{1}{\int tg(t,z)dt} \qquad (5)$$

where the first equality follows from (2). (5) says that, whatever the outflow function, the average exit rate from unemployment is the reciprocal of the average duration of unemployment for those entering unemployment. So, if a change in z is to leave the exit rate from unemployment unchanged it must leave $\int[1-G(t,z)]dt$ unchanged. Looking at (5) we can see that the impact of a change in z on the proportion LTU will be determined by the impact on the numerator. There is a parallel here to the literature on increasing risk in the economics of uncertainty. Rothschild and Stiglitz (1970) show that a mean-preserving spread in the distribution of a random variable will increase the numerator of (3) while leaving the denominator unchanged. So if the distribution of spell lengths for those entering unemployment alters in such a way as to increase the numbers with short spells but also to increase the numbers with long spell lengths keeping the average spell length the same, then this will increase the proportion of LTU. But, this result is not in terms of the outflow rate or duration dependence so let us consider a result more closely related to it. A natural definition of an increase in negative duration dependence is if a rise in z raises the outflow rate for $t<t$ and reduces it for $t\geq t$ where t is arbitrary. The following Proposition shows that this will always increase the proportion LTU.

Result 2: If $h_z(t,z)\geq 0$ for $t<t$ and $h_z(t,z)<0$ for $t>t$ but the average exit rate from unemployment is unchanged then the proportion LTU will increase.

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4. It is perhaps worth noting that this problem is even more acute if one uses statistics on the distribution of completed spells of unemployment. Suppose we used the proportion of spells of unemployment that last longer than a certain period as a measure of LTU incidence. It should be readily apparent that this measure is given simply by one minus the distribution function, G(t), as defined in (1). This is entirely determined by the outflow rates at short durations and is unaffected by outflow rates at long durations for the simple reason that once one has become long-term unemployed the outflowrate thereafter has no effect on whether the spell is labelled as a long one.

Proof: See Appendix.

So far we have shown how the proportion of long-term unemployed is likely to be determined by the average exit rate from unemployment and the degree of duration dependence. But, we have worked in steady-states and outside steady-states things might be rather different. Suppose (in the interests of simplicity) that the outflow rate does not vary through time but the inflow into unemployment does. Denote by N(s) the inflow into unemployment at time s. Then, if we examine the structure of unemployment at time t, [1-G(t-s)]N(s) of those who entered unemployment at s will still be unemployed. Hence, if we denote by P(t,t) the proportion of the unemployed at time t who have been unemployed with duration t or longer we will have:

$$P(t,t) = \frac{\int_{t}^{\infty} N(t-s)[1-G(s)]ds}{\int_{0}^{\infty} N(t-s)[1-G(s)]ds} \qquad \textbf{(6)}$$

It is straightforward to see that this reduces to (3) if the inflow into unemployment is constant. The proportion LTU will obviously tend to be lower if the inflow to unemployment was particularly high in the recent past. As the inflow into unemployment is likely to vary over the business cycle this is likely to have particular implications for the cyclical behaviour of the LTU, though we would not expect it to be able to explain systematic differences in the incidence of LTU across countries or over long periods of time. One could further generalise (6) by allowing the outflow rate to vary over time (see Nickell, 1979, for a working-out of this): this simply has the unsurprising effect of saying that if the outflow rate was particularly low in the past then this is likely to raise the proportion LTU.

In this section we have shown how the most commonly used measure of the incidence of LTU is likely to be affected by the average exit rate from unemployment, the nature of duration dependence and variations in unemployment inflows and exit rates over calendar time. The next section attempts to see which of these factors seems to account for the variation in LTU observed across countries and over time.

2.2 The Causes of Variation in the Incidence of LTU

In this section we will try to use the analytical framework of the previous section to explain some of the main variations in the incidence of LTU. To put the question at its most stark we are interested in whether the rise in the incidence of LTU in Europe since the 1960s is associated with changes in the average exit rate from unemployment or the degree of duration dependence. Such an exercise obviously has implications for policies that one might pursue to reduce the incidence of LTU as, for example, finding that changes in duration dependence are most important might suggest that something should be done to improve the relative exit rate of the long-term unemployment. But when one looks at the existing literature there is surprisingly little information related to this basic question. What there is suggests no very dramatic changes in duration dependence over the period of the large rise in the incidence of LTU. For the UK Haskel and Jackman (1988) show that a general fall in outflow rates can explain the change in the duration structure of unemployment and Jackman and Layard (1991) examine outflow rates using outflow data and argue that the ratio of outflow rates at different durations is relatively constant over the period: similar conclusions would seem to be true for Spain (see Toharia, 1997) and for Finland (Eriksson, 1996).

Given the importance of the issue and the paucity of exiting information we decided to try to get some indication for ourselves of the main determinants of variation in the incidence of LTU. The analysis is relatively crude and the results should be interpreted with some caution but we believe that this exercise does give some insight. It would be extremely useful if researchers with better access to data on unemployment outflows could investigate this further.

What we did was to fit Weibull duration models to the data on the duration structure of incomplete spells that were used to construct the graphs in Figure 1[5]. The Weibull model assumes that the outflow rate is of the form:

$$h(t) \quad ' \quad \mu^{a} a^{1\&a} G(1/a)^{a} t^{a\&1} \qquad \textbf{(7)}$$

There are two parameters which determine the duration structure of unemployment: μ which is the average duration of unemployment spells (or the inverse of the average exit rate — see (5)) and a which is a measure of duration dependence. If $a=1$ there is no duration dependence and the outflow rate is simply equal to μ at all durations while $a<1$ corresponds to negative duration dependence. We chose to use the Weibull function because it is the simplest duration model in which we can hope to capture the impact of the average exit rate and duration dependence. If one draws the relationship between the log of the outflow rate and log duration then it is a straight line, the slope of which is determined by a and changes in μ lead to uniform shifts in it.

We used the outflow function in (7) to derive the distribution of incomplete spells and then we used data on the duration structure of unemployment to estimate the parameters (a,μ). Table 4 compares the estimates of the parameters from the structure of unemployment in the 'golden age' of low unemployment and currently. On the whole, the estimates are sensible: the estimated average duration of unemployment is more or less in line with other estimates even though we are not using any data on outflow rates.[6]

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5. This type of exercise was, to the best of our knowledge, first done in Salais (1974).

6. There are a number of reasons for interpreting the results with caution. First, as we shall see below, there is evidence for a number of countries that duration dependence is not adequately captured by a Weibull model. Secondly, economies are not in steady-state as the formulae used to compute the duration structure of

Suppose we try and use this framework to address the question of why there has been a rise in the incidence of LTU over time. This might be because of a fall in the average exit rate from unemployment (which would cause the outflow rate to fall at all durations) or from increased negative duration dependence (i.e. a twisting in the relationship between the outflow rate and duration dependence). Table 4 suggests that there is no indication of worsening duration dependence over time and that the increase in the incidence of long-term unemployment can be accounted for by a collapse in exit rates from unemployment at all durations (i.e. the log outflow function shifts down without the slope altering). If anything negative duration dependence seems to have been reduced.[7]

If we look at cross-sectional variation in the incidence of long-term unemployment, we get a similar picture — see the additional estimates in Table 5. Differences in duration dependence do not seem to be the main explanation of differences in the incidence of LTU with the exception of Sweden which has a large degree of positive duration dependence (see below). Given the scarcity of evidence this conclusion that differences in average exit rates are the main explanation of differences in the incidence of LTU must remain tentative: this is an area where more research is needed.

Finally let us consider the variation in the incidence of LTU over the cycle. Figure 4 presents a plot of the proportion LTU against the OECD standardised unemployment rate. Observations are marked with the relevant year to enable the reader to track the development over time. Two points emerge from this Figure. First there is a generally positive relationship between the overall unemployment rate and the incidence of LTU. Why should there be this relationship?

In a steady-state the unemployment rate,u, is the following function of the inflow rate into unemployment, i, and the average exit rate, h:

$$u = \frac{i}{i+h} = \frac{\mu i}{\mu i+1} \qquad \textbf{(8)}$$

where μ is the average duration of unemployment. As has been documented elsewhere (e.g. Jackman, Layard and Nickell, 1991), inflow rates into unemployment do not show any very dramatic trends over time so that the rise in unemployment can all be 'explained' by this collapse in the average exit rate. As we have already seen, variations in the incidence of LTU over time are also primarily caused by variations in μ and it is this common cause which accounts for the strong positive relationship between unemployment rates and the incidence of LTU. This argument has been pushed very strongly by Webster (1996) who shows that a stable relationship exists between the long-term unemployment rate (rather than the incidence of LTU) and the aggregate unemployment rate over time, across countries, across regions in the UK and even down to very small areas within individual British cities.

(8) can also help us to understand why some groups with high unemployment rates have relatively low incidences of LTU. If a group has a high inflow rate into unemployment then it will tend to have a high unemployment rate but this high inflow rate does not have implications for the incidence of LTU. This observation can help to explain why North Americans and young people

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unemployment implicitly assume.

7. Caution is needed here. There are reasons (outlined below) for thinking that the negative duration dependence induced by heterogeneity among the unemployed becomes more acute when the overall exit rate from unemployment is high.

tend to have a low incidence of LTU even when their unemployment rates are relatively high.

The second feature of Figure 4 is that, over the cycle, long-term unemployment displays anti-clockwise loops or, alternatively, it lags behind actual unemployment. If we start from the peak of the cycle as unemployment rises the share of long-term unemployment actually falls at first but then rises. Once we reach the trough and unemployment starts to fall the proportion LTU continues to rise for a while but then falls. The consequence of this is that for given a level of unemployment, the incidence of LTU is generally higher in the recovery than the slump. This has been misinterpreted some of the time (Webster, 1996, would be an honourable exception). For example, OECD (1993, page 86) observed that, for a given level of unemployment, long-term unemployment was higher in the late 1980s than the early 1980s and concluded that "in many countries the relationship between long-term unemployment and total unemployment has shifted over time with the incidence of the former rising for a given unemployment rate". But this misses the point that the latter period was a period of recovery and the former was a slump. Casual inspection of Figure 4 does not suggest that there has been any deterioration in the relationship between unemployment and LTU over a long period. This is consistent with our earlier findings that duration dependence and inflow rates do not seem to have changed very much over time.
Why does the incidence of LTU display these loops over the cycle? There are two main possible explanations. The first is in terms of the variation in the inflow into unemployment over the cycle. If the onset of recession is associated with higher rates of job destruction which creates a larger pool of the short-term unemployed then we would expect to see the pattern of loops we observe. Alternatively it is possible that the outflow rate for the long-term unemployed collapses more in the recession as employers have a larger pool of unemployed from which to choose (the ranking model of Blanchard and Diamond, 1994, in which employers always choose to hire workers with shorter durations would have this prediction). Nickell (1979) argues that it is variation in the inflow over the business cycle that accounts for the loops in the UK. But this is another area where more research is needed.

3. Explaining the Average Exit Rate from Unemployment

As we have seen, being able to explain the average exit rate from unemployment is crucial to explaining the incidence of long-term unemployment. This section reviews what we know about this.

Let us start by attempting to explain the collapse in the average exit rate from unemployment that has occurred since the 1960s in many European countries. From our earlier discussion, any explanation of the rise in unemployment must also be an explanation of the fall in the average exit rate (and vice versa) and the voluminous literature devoted to trying to understand the rise in unemployment becomes relevant here. At this point we come up against our promise at the start of the paper that we would make no attempt to explain the level of unemployment, only its structure. We have arrived at a point where it becomes apparent that one cannot separate the analysis of the determinants of the level and structure of unemployment in this way: it seems very likely that both high unemployment and a high incidence of LTU have a common cause, an 'X' factor or factors which has resulted in a collapse of exit rates for the unemployed at all durations. The usual suspects for the 'X' factor are generous welfare benefits, powerful trade unions, high minimum wages, employment protection, skill-biassed technical change etc. We are going to stick to our promise not to evaluate this literature. But while some of these factors do seem to be important there still seems to be an important part of the rise in unemployment since the 1960s which is something of a mystery. We know of no time-series model which has managed to explain

the rise in unemployment since the 1960s without recourse to some arbitrary dummy variables or time trends which account for a large part of the explanatory power. The basic problem here is that labour market institutions have not changed enough over the past 30 years to provide a plausible explanation of the rise in unemployment.

There has been more success in explaining the cross-sectional variation in unemployment rates in terms of labour market institutions. For example, the chapter by Layard and Nickell, finds that the replacement ratio, benefit duration, union coverage and coordination are significant in explaining unemployment across OECD countries. For explaining long-term unemployment employment protection legislation and benefit duration are more important. Of course, the number of observations is small in these regressions and there is limited allowance for country-specific fixed effects but these regression have been more successful than those that attempt to explain the time-series variation.

One should also remember that there are more microeconometric studies that may also be relevant here. For example, many micro studies (some of which are reviewed below) have found a link between benefits and the duration of unemployment at individual level though very few of the estimates are large (see Atkinson and Micklewright, 1991, for a review).

4. Explaining Duration Dependence

Virtually all countries exhibit negative duration dependence (i.e. if one takes two unemployed people at random, one would expect the one with the shorter unemployment duration to leave unemployment more quickly). This negative duration dependence contributes to the incidence of LTU. This section aims to explain why this duration dependence exists and to review the literature that tries to explain differences in duration dependence across countries. One of the main issues is the extent to which this duration dependence reflects differences in the characteristics of workers of different unemployment durations or whether it applies equally well to workers with the same characteristics so it is this issue which we consider first. This matters because true duration dependence suggests that it might be worthwhile designing policies to prevent people becoming long-term unemployed (we discuss this further below) while the heterogeneity view would suggest the desirability of helping particular groups whatever their duration of unemployment.

4.1 Unobserved Heterogeneity versus True Duration Dependence

We generally observe that the outflow rate declines with duration of unemployment. Perhaps the most natural interpretation of this is that the long-term unemployed have a lower chance of finding a job (i.e. anyone entering unemployment but being unlucky and not finding a job would find their outflow rate declining). This is what is called true duration dependence. But there is an alternative hypothesis that could potentially explain a falling outflow rate. Consider the simplest possible example. Suppose the inflow into unemployment is made up of two distinct groups of individuals who have different outflow rates which we will denote by h_0 and h_1 (assume $h_0<h_1$). These outflow rates are assumed not to be observable by the researcher, so we have a situation of what is called unobserved heterogeneity. We will assume that these outflow rates do not change over time so that a given individual would experience no fall in their outflow rate during a spell of unemployment. What would an outside observer see as the outflow rate at different durations of unemployment? If we denote the share of the first group in the unemployed with duration t by s(t) then the observed outflow rate at duration t will be a simple weighted average of the outflow

rates of the two groups $h(t)=s(t)h_0+(1-s(t))h_1$. From this one can see that the outflow rate would not change over time if s(t) was constant. But, in fact, this cannot be the case. The reason is simple. The group with the higher outflow rate will tend to leave unemployment at a faster rate so the proportion of the unemployed with the high outflow rate will fall as the duration of unemployment rises. In fact one can show that:

$$s(t) \quad ' \quad \frac{s(0)}{s(0)\%e^{(h_0\&h_1)t}(1\&s(0))} \qquad \textbf{(9)}$$

where s(0) is the share of the high outflow rate group in the inflow to unemployment. s(t) increases monotonically from s(0) to 1 so that the outflow rate will be observed to fall with duration in the presence of unobserved heterogeneity.

This result is much more general than the specific example given here. Suppose that we can represent the unobserved heterogeneity by a parameter v and that we can write the outflow function at duration t for someone with unobserved parameter v in the multiplicative form h(v,t)=vh(t). Then, as individuals with low outflow rates will always tend to be over-represented in the stock of unemployed with longer unemployment durations, unobserved heterogeneity will always lead to negative duration dependence whatever the distribution of v.

There is a substantial literature which attempts to distinguish the hypotheses of unobserved heterogeneity from true duration dependence (see Lancaster, 1990, Chapter 7, or Heckman, 1991, for surveys). Some of this literature is very technical whereas other parts are more intuitive.

Let us start with the more technical literature. Elbers and Ridder (1982) and Heckman and Singer (1984) both discuss identification in the so-called mixed proportional hazard model where we can write the hazard function for outflows as:

$$h(v,x,t) \quad ' \quad h(t)\mathrm{f}\,(x)v \qquad \textbf{(10)}$$

where x is a set of characteristics observable to the econometrician and v is a parameter which varies across individuals but is unobserved by the researcher. A number of sufficient conditions for identification of the shape of the function h(t) (which is often termed the baseline hazard), and the distribution of unobserved heterogeneity are provided. For example, Elbers and Ridder show that if v has finite mean then one can identify the distribution of v, h(t) and f (x) up to two normalizing constants as long as one has at least two distinct sets of characteristics. It should be noted that this identification is achieved without having to make any parametric assumption about the form of the functions though the mixed proportional hazard model is, of course, a substantial restriction on the admissible forms of the hazard function. This type of result is weakened slightly by Heckman and Singer (1984) and by Honoré (1993) who shows that if one has multiple unemployment spells for the same individual then one does not even need v to have finite mean. While these results are perhaps surprisingly strong given the apparently weak nature of the assumptions made there is no empirical study (as far as we are aware) that has made use of them and their practical relevance remains to be demonstrated. This is perhaps not surprising when one thinks about the sample sizes and nature of data that would be needed to implement them.

Those papers that have attempted to disentangle true duration dependence from unobserved heterogeneity have normally achieved identification by making specific assumptions about the functional form of the baseline hazard and the distribution of unobserved heterogeneity. Heckman and Singer (1984) and Lancaster (1990) provide a set of results of this type (e.g. one can show that if the true outflow function is Weibull then one can identify the distribution of v as long as it has

a finite mean, even without regressors). Most papers that have attempted to actually provide estimates take a more parametric approach than this: for example, they may assume that the baseline outflow is of the Weibull form while v has a gamma distribution. Lancaster (1990, page 157) summarized this work by concluding that "identification can be achieved when certain functional form restrictions can be assumed. Unfortunately these functional form restrictions generally have little or no economic-theoretical justification. There is no known economic principle that implies that hazard functions should be proportional...still less does economic theory imply Weibull models". In fact one might go further and conclude that none of the explicit theoretical models of duration dependence (e.g. Lockwood, 1991; van den Berg, 1990; Blanchard and Diamond, 1994) would support the proportional hazard specification and its widespread use is justified primarily by its convenience. And Narendranathan and Stewart (1993), using UK data, rejected the proportional hazard specification.

There is another part of the literature on this subject which has more modest aims than attempting to completely identify the true duration dependence. These are papers which ask whether the observed data is consistent with a model in which there is no duration dependence at all. These have been christened 'eyeball' tests by van den Berg and van Ours (1997) as they generally rely on looking at simple aspects of the data and there is no formal testing of hypotheses. To give an example of how this type of approach might work suppose that we found there was positive duration dependence in our data. Then, as we know that unobserved heterogeneity (of the multiplicative form) always leads to negative duration dependence, this indicates that there must be some true positive duration dependence. This particular result is probably not much use given that, as we have seen above, the empirical finding is more commonly that of negative duration dependence.[8] So, there has been some attempt to provide tests of the hypothesis of no duration dependence in other circumstances.

Perhaps the most credible is a test first suggested by Jackman and Layard (1991). Suppose that there is no true duration dependence and that one can write the outflow rate of an individual with unobservable characteristics v as hv. Let us denote the distribution of v among the inflow into unemployment by H(v). Fairly obviously the observed outflow rate h(0) among the new inflow into unemployment must be given by:

$$h(0) \;=\; \int hv\,dH(v) \;=\; hE(v) \qquad \textbf{(11)}$$

where E(v) is the expected value of v among the inflow into unemployment. Now consider the average outflow rate among the stock of the unemployed. From our earlier discussion we know that this is the inverse of the average spell of unemployment for someone entering unemployment (see (5)) so that we have:

$$\bar{h} \;=\; \frac{1}{\int\int e^{-hvt}\,dt\,dH(v)} \;=\; \frac{h}{\int \frac{1}{v}\,dH(v)} \;=\; h/E(1/v) \qquad \textbf{(12)}$$

8. One can derive other restrictions on the outflow function implied by a model of pure unobserved heterogeneity (see Chamberlain, 1980) but these do not seem to have been used in practice.

What Jackman and Layard noticed is that the ratio of the exit rate from unemployment for the newly unemployed to the average exit rate is independent of h. They then argued that if one has two steady-states which differ only in h (i.e. the distribution H(v) is the same) then zero duration dependence implies that the exit rate for the newly unemployed should be a constant multiple of the average exit rate. They show that this is not the case for British data: from the late 1960s to the late 1980s the average exit rate has fallen much more than the exit rate for the newly unemployed.[9] Given this rejection of pure heterogeneity one might want to conclude something about the nature of duration dependence: there is nothing in Jackman and Layard (1991) to allow us to draw any conclusions along these lines but the more formal study of van den Berg and van Ours (1997) show that strict negative (positive) duration dependence implies an increase in h reduces (increases) h(0)/h so that the Jackman-Layard results suggest that there is powerful negative duration dependence. This result is open to criticism as the assumptions of multiplicative separability in the specification of the outflow rate and that the inflow into unemployment has the same distribution of v in the two steady-states are not innocuous. While it might be reasonable to assume that the two steady-states have the same distribution of v in the population, the two steady-states will have different levels of unemployment so that the inflow into unemployment will, in general, not have the same distribution of v.

A second 'eyeball' test suggested by Jackman and Layard (1991) and Budd, Levine and Smith (1998) involves looking at the sign of:

$$\frac{\partial^2 \log h(t,\mu)}{\partial t \partial \mu} \qquad \textbf{(13)}$$

where μ is the average exit rate from unemployment and hence a measure of how tight is the labour market. The intuition is the following. If the average exit rate from unemployment falls then this has a bigger effect on the survivor rate for those with high intrinsic exit rates. Hence the average quality of the long-term unemployed will rise so that their outflow rate will no longer be lower than it was before. The problem with this has been identified by van den Berg and van Ours (1997) who present several counter-examples to show that this intuition is not always well-founded. When the average exit rate is high, unobserved heterogeneity may resolve itself more quickly but once, resolved, there will be little apparent duration dependence.

Van den Berg and van Ours also present an eyeball test of their own for the presence of unobserved heterogeneity. If the outflow rate is of the form in (10) then if there is no unobserved heterogeneity we have that the ratio of the outflow rates at different durations should be independent of x (they use calendar time but one could use any variable). They show that unobserved heterogeneity will mean that this is not the case. Of course the validity of this eyeball test is crucially dependent on the separability imposed in (10), a hypothesis they do test to some extent.

To conclude, it does not really seem possible in practice to identify separately the effect of heterogeneity from that of duration dependence without making some very strong assumptions about functional form which have no foundation in any economic theory. With this in mind, let us review the large number of pieces of work that have tried to estimate the degree of duration

9. This is consistent with our earlier conclusion that the outflow rates have fallen by equal proportional amounts at all durations. A uniform proportional fall in outflow rates will lead to relatively more long-term unemployed lowering the average outflow rate among the stock more than the fall in the outflow rate at a given duration (a compositional effect).

dependence in the next section.

4.2 Estimates of Duration Dependence

In this section we review the estimates of duration dependence obtained from microeconometric studies. Of course these studies differ in the samples used, the specification adopted and the other controls so we will start by attempting to outline the main issues.

The vast majority of studies use a specification for the outflow rate of the form in (10). In terms of specification perhaps the most important issues are:

- the specification of the function h(t) (the baseline hazard)
- the treatment of unobserved heterogeneity, v
- whether single or multiple exit destinations from unemployment are considered

For a more detailed discussion of the estimation of duration models see Lancaster (1990).

For the baseline hazard the most common specifications are a Weibull hazard, or a piecewise constant hazard in which durations of unemployment are grouped together into a relatively small number of categories and the hazard is assumed constant within those categories or a completely flexible specification in which the hazard rate at all durations can be separately estimated (one then needs to use the semi-parametric estimation method proposed by Cox to estimate this model). The flexible specification is perhaps to be preferred as the Weibull specification restricts the hazard rate to be monotonic and there is evidence from a number of samples that the hazard rate is non-monotonic. In addition, there is evidence from some studies we cite below that there is a spike in the hazard rate at some durations. Any parametric specification for the hazard will find it difficult to model this so that a flexible specification might be preferred for this reason although one should remember that the precision of the estimates will obviously be less than for a correctly specified parametric model.

If the specification for the hazard also contains covariates which vary over time, then this can also be a source of duration dependence and needs to be borne in mind in interpreting results. Perhaps the most commonly used variable of this type is the time remaining until the expiration of welfare benefits (or some other measure of the time variation in benefits). This line of research has been pursued most actively in the US where Katz and Meyer (1990a,b) and Meyer (1990) find spikes in the hazard around the time of expiration of eligibility for unemployment insurance. Research along these lines is much rarer in Europe, perhaps because of the lack of variability of, or information on, eligibility and perhaps because benefits tend to be of much longer duration. However, some studies (e.g. Carling et al, 1996; Micklewright and Nagy, 1997) find similar results for Europe.

In terms of the treatment of unobserved heterogeneity, there are a number of assumptions that are popular. One is to assume that v has a gamma distribution: another alternative is to assume that v has a distribution with support at a discrete number of points, the precise number generally being determined empirically. One should also remember that the inclusion of standard covariates in the hazard function like age, education and race also has the effect of picking up some of the heterogeneity among the unemployed.

Finally, there is the issue of whether the studies distinguish between the destinations of the individuals when they leave unemployment. The possible destinations which have been considered in the literature are employment (with distinctions sometime made between returns to the same and different employers), inactivity (which could be broken down into further sub-groups) and labour market programmes.

With these points in mind, Table 6 summarizes the findings on duration dependence in Europe. The raw data for most countries exhibit negative duration dependence though this is not always apparent when reading the studies. Table 5 shows what happens when one fits a Weibull hazard model to the duration structure of unemployment for the current EU countries. They all exhibit negative duration dependence with the notable exception of Sweden. This peculiarity of Sweden has been noted before and has been used to argue that Sweden has been particularly successful in reintegrating its long-term unemployed into work through its use of limited duration of unemployment insurance and active labour market policies (see, for example, Jackman et al, 1996).

But how well do these findings stand up when researchers control for both observed and unobserved heterogeneity? Table 6 suggests that they are not robust: most countries show very little evidence of 'true' duration dependence for the exit rate into employment after controlling for heterogeneity. The one exception to this would appear to be the UK where most studies do appear to find evidence of strong negative duration dependence. Given the problems in separately identifying the effect of unobserved heterogeneity and true duration dependence it is possible that the controls for unobserved heterogeneity take out too much (often they are the only way the covariates can interact with duration in the hazard function) but even the studies which only control for observed heterogeneity tend to find little evidence for strong negative duration dependence. Our impression is that, overall, the results for Europe on duration dependence do not seem to suggests any very marked negative duration dependence once one controls for a few readily observable characteristics. Of course, better controls for characteristics might be expected to lead to estimates of positive duration dependence.

Many of the unemployed do not leave unemployment for jobs: a substantial fraction simply become inactive. Studies on the exit rate to inactivity tend to find evidence of positive duration dependence. This is consistent with the view that the long-term unemployed tend to become detached from the labour market, eventually becoming so detached they are no longer classified as unemployed.

What is also true is that these studies do have some lessons about the labour market institutions that tend to be associated with duration dependence. First, all the studies which have studied the issue tend to find a spike in the outflow rate around the time of the expiration of benefits. This spike occurs for transitions into both employment and inactivity. This suggests that limiting the duration of benefits will be likely to lead to less long-term unemployment. Research into this issue is probably less satisfactory in Europe than in the US because most European countries have a single national system for eligibility for welfare benefits so that levels and of receipt are determined primarily by personal characteristics that themselves might have separate influence on unemployment durations. There is little in the way of sample variation in welfare receipt caused by the federal system of the US or the explicit use of experimentation. The classic theoretical analysis of the effect of a limited duration of benefits is Mortensen (1977). He showed that, as the individual approaches the end of benefit eligibility, they will reduce their reservation wage and hence the outflow rate will rise. After expiration the outflow rate is constant. The data do not actually fit this pattern as there is typically a rise in the outflow as expiration approaches after which the outflow typically falls again to similar levels as before. This might suggest that individuals do have some control over when they start work or that something like the stock-flow approach to matching (discussed further below) would be more appropriate. One consequence of the spike is that the predicted effects of reducing the period for which benefits are paid are generally small as one gets a rise in the outflow for a relatively short period of time.

Secondly, labour market programmes for the long-term unemployed seem to be able to raise the exit rate from unemployment for the long-term unemployed. These programmes may take

the form of the provision of a job, training or just help with the process of job search. In particular, the very low incidence of LTU in Sweden is often put down to the large-scale of labour market programmes. There is some concern that these programmes only disguise long-term unemployment by categorizing individuals as something other than unemployed for a while and then classifying them as newly unemployed when they complete the programme. For example, although Table 1 shows that Sweden has a low incidence of LTU, something like 50% of the unemployed have had no regular employment in the past year (Calmfors, 1996).

Thirdly, the institution of temporary lay-offs may also contribute to duration dependence. In some countries (the US, Canada and Denmark) a high proportion of inflows into unemployment end in the individual returning to their original employer: in other countries temporary lay-offs of this type are very rare (though information on the use of temporary layoffs is very sketchy for many countries). Katz and Meyer (1990) found that the outflow rate for recall to the original employer did show negative duration dependence while that for new jobs did not (though both had spikes around the time of expiration of benefits). They suggested that a large part of the negative duration dependence in the US could be explained by recalls to the previous employer. The US literature on temporary lay-offs (see, for example, Feldstein, 1976, 1978; Topel, 1983; Card and Levine, 1994) tends to focus on the idea that the imperfect experience-rating of the unemployment insurance system subsidises lay-offs. Benefit systems in European countries are not experience-rated at all so that one might then expect these countries to have higher lay-off rates: this is not the case. Of course, stringent employment protection laws in some southern European countries may prevent this and some of these countries do have systems which subsidise employers to keep on workers when they would otherwise lay them off (the cassa integrazione guadagni in Italy, for example): these workers are generally not classed as unemployed. But what does not seem to have been explored much in the literature is the fact that experience-rating creates positive incentives for employers to re-hire previous workers who are still receiving benefits, incentives that do not exist in systems that are not experience-rated[10]. As these workers are likely to be of relatively short duration this will tend to create negative duration dependence. Feldstein (1976, page 834) argued that "while UI increases the duration of any given spell of unemployment, it may also induce more very short spells of unemployment".

4.3 Explanations of 'True' Duration Dependence

In this section we will discuss the explanations that have been proposed for why the outflow rate might vary systematically over a spell of unemployment. We will frame this discussion in terms of a standard search model in which the environment an individual worker faces can be thought of as being characterised by a wage offer distribution, a job offer arrival rate (which may depend in part on search intensity) and a utility function giving the utility both when employed and unemployed. Search models have tended to focus exclusively on the transition from unemployment to employment so we will focus on that transition here. Given this environment certain decisions which influence the outflow rate will be made by the worker notably the choice of a reservation wage and a level of search activity. We could summarize that outflow rate for a worker of duration t as being given by:[11]

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10. See Fitzroy and Hart (1985) for a discussion of these issues and an explanation of the difference in the use of temporary lay-offs based on the structure of social security contributions.

11. Obviously there are other factors that will influence the outflow rate but we have suppressed this to focus on the issue of duration dependence.

$$h(t) \quad ' \quad ?(t,c(t))[1\&F(r(t),t)] \qquad \textbf{(14)}$$

where ? is the arrival rate of job offers from employers (which could be further decomposed into a contact rate and an employer acceptance rate), c is the search intensity of the worker, F(w,t) the wage offer distribution facing an unemployed worker of duration t and r the reservation wage. From this it should be apparent that one can think of duration dependence as coming from one or more of the following sources:

- a job offer arrival rate that varies with duration
- search intensity that varies with duration
- a wage offer distribution that varies with duration
- a reservation wage that varies with duration

One should be careful not to think of these as completely independent. For example, a worsening wage offer distribution might be expected to alter the reservation wage and search intensity. But, it is useful as a framework for thought and all of the above have been mentioned as possible sources of 'true' duration dependence.

If the human capital of the unemployed deteriorates with long spells of unemployment then we would expect the wages that the unemployed can command in the market will also deteriorate making it likely that, for a given reservation wage, the outflow rate will fall with duration. Of course it is quite likely that the reservation wage will itself fall when job opportunities worsen, partially off-setting the adverse effect on the outflow rate, but Burdett (1981) has shown that if the wage offer distribution is log-concave (a condition satisfied by most commonly used distributions) then this effect cannot off-set the direct effect.

Is there any evidence that human capital deteriorates with duration of unemployment? Direct evidence on this is hard to find but surveys of employers do seem to indicate a relatively widespread belief in this, though whether these beliefs are grounded in actual experience is another matter (see Meager and Metcalf, 1987, 1996; Winter-Ebmer, 1991). Employers who have been induced to take on the long-term unemployed by various subsidy schemes do not report that they are worse than their average recruit and often express the view that the worker was so desperate for work that they had a 'good' attitude. In addition, it is unclear whether the jaded views of employers about the work motivation and productivity of the long-term unemployed reflect the importance of unobserved heterogeneity or duration dependence. To some extent it may not matter: if employers cannot perfectly observe the productivity of job applicants so that the heterogeneity is unobserved by the employer as much as the econometrician then they are likely to engage in statistical discrimination against the LTU, a strategy that will punish those whose productivty is not low as much as those whose is. In this case unobserved heterogeneity will itself cause duration dependence. In a theoretical framework this idea has been pursued by Lockwood (1991) who shows that when it is costly for employers to test workers they may use unemployment duration as a signal on which to base employment decisions. Acemoglu (1995) constructs a model in which unemployed have some choice about whether to invest to maintain their skills when unemployed and shows that there can be multiple equilibria: a good one in which the LTU maintain their skills and employers do not discriminate against them and another in which the LTU do not maintain their skills and employers, having only an imperfect measure of productivity, do discriminate against them.

It is also worth noting that most studies (e.g. Gregg and Wadsworth, 1997, for the UK) find that wages on entry into employment are lower for those with longer spells of unemployment

suggesting some deterioration in their human capital or reservation wage or both. Again, this information on its own cannot distinguish between heterogeneity and true duration dependence as possible explanations.

In a standard search model the arrival rate of job offers should be interpreted as the flow of vacancies times the probability of seeing a vacancy times the probability of being offered the job. Each of these components might itself vary with the duration of unemployment. The image of job search in traditional search theory is of a worker trudging from factory gate to factory gate knocking on doors and asking if the firm has a vacancy. In this world the stock of vacancies matches with the stock of unemployment: this stock-stock approach is the one taken in Diamond (1982), Pissarides (1990), Blanchard and Diamond (1990) and many other papers. It lies behind the traditional specification of the matching function.

But there are good reasons to wonder whether this is appropriate imagery for the process of job search as experienced by workers. Workers who become unemployed generally have a good idea about where they can find out about vacancies. They may look in a newspaper, visit a public (or private) employment agency, or ask friends and relatives. On entering unemployment, it is reasonable to assume that workers can quickly sample from the stock of vacancies. They then apply to the jobs that interest them and wait for the results. If they are unlucky and do not get the job they have two options: lower their standards for the existing stock of vacancies or wait for a new vacancy to come onto the market. Both options mean it is reasonable to believe that the number of vacancies sampled by the unemployed fall fairly rapidly in the first few weeks of unemployment leading to negative duration dependence. Coles and Smith (1994) have analysed markets like this in the limiting case where unemployed workers can immediately process all the vacancies on the market at any one time. In this view of the labour market it is the flow of the unemployed who match with the stock of vacancies and the flow of vacancies which match with the stock of the unemployed, so it is natural to label it the stock-flow approach.

Research into the stock-flow approach is very much in its infancy but it does have considerable appeal, largely because its modelling of the process of job search seems more in line with the process by which workers actually find jobs (see Gregg and Petrongolo, 1997, for an empirical application of the approach for UK data). One possible way of thinking about the difference between the stock-stock approach and the stock-flow approach is the following. In the stock-stock approach the implicit assumption is that it is time-consuming to sample vacancies and that the worker never samples more than a minuscule fraction of the existing stock of vacancies so that the expected time to the next vacancy remains constant over time. In contrast, the stock-flow approach assumes that it takes no time at all to sample a vacancy so that the whole stock is sampled immediately on entering unemployment and only the flow of new vacancies thereafter. The reality probably lies somewhere between these two extremes.

There are other reasons why the flow of vacancies coming to the attention of the unemployed may fall with duration. Many studies have documented the importance of the use of current workers to recruit friends and relatives. Something like a third of jobs in the UK are filled in this way (Gregg and Wadsworth, 1996). The reasons given are generally that it is cost-effective and workers are unlikely to recommend others who they know are going to prove to be unsuitable workers. There is other evidence that suggests that the unemployed lose social contacts as their spells lengthen and that what social contacts they do maintain come to be increasingly made up of other unemployed. Among the reasons given for this are that socialising costs money which the unemployed have little of and the stigma often attached to unemployment in the presence of those who are employed.

Even once the unemployed have become aware of a vacancy they still have the problem of getting the employer to offer them the job. The concern here is that employers, rightly or

wrongly, often throw out applications from the unemployed in general or the long-term unemployed in particular without giving them serious consideration. This 'ranking' idea has been explored more formally by Blanchard and Diamond (1994) who assume that employers always pick the worker with the lowest unemployment duration. They show that this leads to negative duration dependence and that this is likely to get worse the slacker is the labour market. It is worth noting that their specification does not support the mixed proportional hazard models which, as discussed above, are often used in attempts to identify the separate effects of true duration dependence and unobserved heterogeneity.

Turning to search intensity, there are a small number of studies which attempt to examine how search intensity varies with the duration of unemployment. Typically, search intensity is measured in a crude way, either as the number of search methods used, the time or money spent looking for work. The US studies are summarized in Devine and Kiefer (1991). They tend to find a negative correlation between search intensity and unemployment duration. Unfortunately these studies are only based on cross-section data. Such data is unable to distinguish between true duration dependence and individual heterogeneity. It may simply be the case that those individuals with low levels of search intensity are less likely to leave unemployment and hence are more likely to have longer durations. There seems to be little evidence on this subject for Europe but what there is seems to reach similar conclusions (e.g. Schmitt and Wadsworth, 1993, used British data and found that the LTU searched for work less intensively). To resolve the question of individual heterogeneity versus true duration dependence we would obviously like to track search intensity over a spell of unemployment. Erens and Hedges (1990) found evidence of a modest decline in the number of hours spent looking for work over a spell of unemployment on British data.

Turning now to the reservation wage, we have already pointed out that we would expect changes in the wage offer distribution and the job offer arrival rate to alter the reservation wage. But we would also expect changes in the utility available to workers while unemployed to have an impact on the reservation wage. Most attention here has been focussed on the role of the benefit system in inducing changes in the reservation wage. There are a few studies that do have direct information on reservation wages over a spell of unemployment. The US studies summarized in Devine and Kiefer (1991) suggest a modest decline over the course of a spell of unemployment though many of these studies simply look at the correlation of reservation wages with unemployment durations raising questions about the causality and being unable to distinguish between heterogeneity and true duration dependence. Information for Europe is more sparse: Erens and Hedges (1990) in a UK survey of individuals beginning spells of unemployment found that reservation wages appeared to change very little over the course of a spell of unemployment.

5. The Consequences of Long-Term Unemployment

In this section we will try to review some of the work on the main consequences of long-term unemployment. One can divide these consequences into the effects on the individuals who experience long-term unemployment themselves and wider implications for the economy as a whole. We will start with the latter.

5.1 LTU and the Wage Curve

Most of the literature which suggests that high levels of LTU have adverse effects on the whole economy focusses on the impact on wage-setting. It is argued that upward pressure on wages from

the supply side of the economy is likely to be higher if there is a lot of LTU within a given stock of total unemployment. Let us start by reviewing the theoretical arguments for this and then consider the empirical evidence.

We will illustrate our discussion using the Shapiro-Stiglitz (1984) version of an efficiency wage model. The structure of this model is the following. There is a traditional labour demand curve relating employment to the wage paid. The labour supply curve is replaced by a no-shirking condition (NSC) which relates the wage paid to the unemployment rate. Clearly anything that shifts the no-shirking condition up will tend to raise the rate of unemployment in the economy. So, our discussion will focus on the NSC. Suppose that if workers do their job properly they receive wage w but have to put in effort e giving utility (w-e). They become unemployed at an exogenously given job destruction rate, i (the inflow rate into unemployment). Denoting the value of a job by V we have:

$$rV = w - e + i[V^u(0) - V] \qquad \textbf{(15)}$$

But workers also have the option of shirking in which case they do not put in effort e but face an increased risk of job loss at rate f . If we denote the value of shirking by V^s we have:

$$rV^s = w + (i+f)[V^u(0) - V] \qquad \textbf{(16)}$$

The employer will want to pay the minimum wage consistent with the constraint $V \geq V^S$ which can be written as:

$$V - V^u(0) = \frac{e}{f} \qquad \textbf{(17)}$$

Now consider the value of being unemployed. Suppose that the income flow while unemployed is b and that the outflow rate from unemployment at duration t is given by h(t). Then we have:

$$rV^u(t) = b + h(t)[V - V^u(t)] + \frac{\partial V^u(t)}{\partial t} \qquad \textbf{(18)}$$

This differential equation has a solution for V(0) of the form:

$$V - V^u(0) = \int_0^{\infty} (b + rV) e^{-rt} e^{-\int_0^t h(s)ds} dt$$

$$= \int_0^{\infty} (b + rV) e^{-rt} [1 - G(t)] dt \qquad \textbf{(19)}$$

Combining this with (15) we have that:

$$V - V^u(0) = \frac{(w-b)\int_0^\infty e^{-rt}[1-G(t)]dt}{1 + i\int_0^\infty e^{-rt}[1-G(t)]dt} \qquad \textbf{(20)}$$

From this and (17) we can see that the wage that must be paid in equilibrium must be given by:

$$w = b + \frac{e}{f}\left(\frac{1}{\int_0^\infty e^{-rt}[1-G(t)]dt} + i\right) \qquad \textbf{(21)}$$

This is the no-shirking condition. It can be thought of as giving a relationship between the wage and the unemployment rate once one recognises that, in equilibrium, we must have:

$$i(1-u) = \bar{h}u = \frac{u}{\int_0^\infty [1-G(t)]dt} \qquad \textbf{(22)}$$

where i is the inflow rate into unemployment.

There are several things worth noting about (21). First, if r=0 so there is no discounting then the unemployment rate is a sufficient statistic for the position of the no-shirking condition and the duration structure of unemployment is irrelevant for the wage curve. But if r>0, then given the level of unemployment, anything that increases negative duration dependence will tend to increase wages for a given level of unemployment. The intuition for this is simple. To prevent shirking one wants to reduce the utility that shirkers will get if they are caught and become unemployed. As they will be the newly unemployed this means that we want to reduce the value attached to unemployment on entry into it.[12] For a given level of unemployment, a reduction in negative duration dependence will mean that the outflow rate for the long-term unemployed rises and that for the short-term unemployed falls. If workers discount the future the outflow rate at short durations gets more weight so that the value of being newly unemployed falls. But if there is no discounting of the future then this cannot work.

Similar results are found in other models that might be used as microfoundations for the wage curve. For example, Blanchard and Diamond (1994) derive the result in the context of a matching model, Calmfors and Lang (1995) and Manning (1993) in the context of a union bargaining model and Richardson (1997a) in an efficiency wage model.[13] All these studies reach

12. This method of 'punishment' is a blunt instrument as, in equilibrium, none of the newly unemployed will be shirkers. One might think there are more direct ways to punish shirkers e.g. the use of employer references.

13. There are some other models which find beneficial effects from subsidising the employment of the long-term unemployed even when the discount rate is zero. For example, Richardson (1997b) shows that a lump-sum hiring subsidy for the LTU paid for by a tax on employment can reduce equilibrium unemployment in a matching model. But this works primarily because the chosen policy effectively ensures that the employer share of the surplus is increased and would work even if one paid a hiring subsidy to all workers.

the conclusion that the duration structure of unemployment is only likely to have an independent effect of the wage curve to the extent that workers discount the future. While they obviously do discount the future, reasonable parameter values tend to mean this effect is small: Blanchard and Diamond (1994) present some simulations to this effect. However, these models assume that the long-term unemployed are not different in any way from the short-term unemployed. If they were then one would think that the effects might be considerably larger.

In this type of model it is important to realise that there is a potential inefficiency. The duration structure of unemployment matters for the aggregate NSC but individual employers have no incentive to hire unemployed workers in a way that minimizes wage pressure. While it would be socially efficient to always pick the worker with the longer unemployment duration there is no private incentive for employers to do this: indeed, if there was even the smallest decline of productivity with duration of unemployment, the incentive for employers is to do exactly the opposite. This is a point emphasized by Blanchard and Diamond (1994). It is important to realise that the source of this inefficiency is a limitation in the form of labour contracts. The long-term unemployed might be prepared to pay more to gain employment but once they are employed they are no longer any different from any other worker. So, unless workers can pay employers to hire them up-front (i.e. post a bond) the market equilibrium will be inefficient.

There is an empirical literature that tries to look for evidence of the effects considered here, largely for the UK where there has been an especial focus on it. Nickell (1987) was probably the first to investigate this issue in some depth, concluding on the basis of an aggregate time series regression that, for a given unemployment rate, an increase in the proportion long-term unemployed tended to raise wages. Using more disaggregated regional data, Blackaby et al (1991), Blackaby and Hunt (1992) and Manning (1994) also report finding evidence that short-term unemployment alone has an influence on wage determination. Blanchflower and Oswald (1994) are more cautious, arguing that the conclusions of these papers are sensitive to the precise specification adopted. Nevertheless, in their preferred specifications they find no evidence of a significant link between the proportion LTU and wages.

There seems to be very little work on this issue for other European countries. Winter-Ebmer (1994) finds evidence that a high incidence of LTU raises wage pressure for Austria, a conclusion again disputed by Blanchflower and Oswald (1994). And Graafland (1991) found that long-term unemployment had a similar effect of short-term unemployment in an aggregate time-series regression for the Netherlands.

One other problem with these studies is that they often do not test all the hypotheses that one might think are relevant. As we have seen earlier, the variation in the incidence of LTU that is not explained by the level of unemployment is primarily connected with the loops one observes over the business cycle. The proportion long-term unemployed is, after controlling for the level of unemployment, strongly correlated with the change in unemployment. Theoretical models of wage determination like dynamic versions of the efficiency wage model discussed above would suggest a potential role for the change in unemployment in the no-shirking condition (see Manning, 1993). The empirical estimates in Nickell (1987) suggest that one can do just as well in explaining wages by lags on unemployment as by including the duration structure and it seems plausible to think that we simply do not have enough variation in the data to separately identify effects of the duration structure and dynamics of unemployment in wage curves.

5.2 LTU and Unemployment Persistence

Our discussion so far has focussed on the idea that the incidence of LTU has an impact on the overall unemployment rate in the economy. A related idea is the one that the persistence of

aggregate unemployment is related to long-term unemployment. For example, Blanchard and Diamond (1994) argue that while the steady-state effect of ranking rules in hiring might be small, there are more powerful short-run effects. In particular, if there is a sudden boom, prospects for the newly unemployed will improve very drastically if there is negative duration dependence leading to a jump in wages. This effect is less marked if, for example, all workers have the same exit rate from unemployment. Similar ideas can be found in Pissarides (1992) who uses a search model to show how, if workers lose skills when unemployed, a temporary shock can have very long-lasting effects. This idea has the potential to explain why unemployment was so slow to fall in Europe in the late 1980s after the oil price shocks.

5.3 LTU and Inequality

Given that one of the main causes of poverty in European countries is a lack of work, and that one of the consequences of a high level of LTU may be that unemployment is concentrated on a relatively small number of people, it seems plausible to believe that a high incidence of LTU may contribute to income inequality.

The statistics we have discussed so far are not ideal for evaluating the extent to which it is true as they tell us nothing about recurrent spells of unemployment. It is well-known that those with a past record of unemployment are more likely to be unemployed currently (what Heckman and Borjas, 1981, christened occurrence dependence). The extent of the recurrence of spells is obviously important in considering the extent to which total unemployment is concentrated on a few individuals. It is conceivable that unemployment is extremely concentrated even if spells are very short if it is the same individuals who are cycling between unemployment and jobs of short duration.

Perhaps a better measure of long-term unemployment for assessing the links with inequality would be to look at the distribution of the proportion of time spent unemployed over a certain period. A few countries do collect information of this sort in their labour force surveys. Table 7 summarizes the rather sparse information we have been able to collect. It should be apparent from this that a much greater fraction of total unemployment over a year is accounted for by individuals who are unemployed for much of the time in countries which have a high incidence of LTU. Differences in non-employment seem to be less marked. If we look at longer periods of time the data becomes even more sparse but the basic result seems to remain the same.

5.4 LTU and Personal Well-Being

There is a huge amount of work that has considered the link between personal well-being and unemployment, ranging from work that documents the effects of unemployment in the Great Depression on psychological well-being (see the review of Eisenberg and Lazarsfeld, 1938), through to work that studies the psychological and mental effects of joblessness (see the review by Darity Jr. and Goldsmith, 1996) and work that examines links between unemployment and indicators of social dislocation like crime or child ill health (see Fagan and Freeman, 1997, on the former and Joyce, 1990, on the latter). In much of this work unemployment is viewed as a key factor in causing declines in personal well-being, like deterioration in self-esteem, health and suicide, and an increased propensity to engage in illegal (out of the labour market) activities.

In cross-section regressions there is clear evidence that unemployment is associated with lowered levels of psychological well-being. For example, Clark (1996) uses 1991 International Social Survey Programme data for 16 countries concluding that being unemployed is somewhat worse than being divorced in its effect on subjective measures of personal well-being. Panel

studies by Clark (1996) on British data, Korpi (1997) on Swedish data and Winkelmann and Winkelmann (1998) on German data confirm that becoming unemployed worsens well-being and getting a job improves it. Agerbo et al (1997) find, using Danish data, that a recent spell of unemployment is a powerful predictor of admittance to psychiatric hospitals. Goldsmith, Veum and Darity Jr. (1996) use US National Longitudinal Survey of Youth (NLSY) data to consider the relationship between measures of self-esteem and labour force history. Their main findings are that individuals' perceptions of their own self-worth do deteriorate if they experience spells of unemployment or time out of the labour force. However, the way that they model non-employment spells means it is rather hard to say anything about the impact of duration.

All of this suggests (unsurprisingly) that unemployment is damaging for those who experience it. What is much less clear is the relationship between unemployment duration and indicators of personal well-being. Indeed, some commentators (e.g. Feather, 1990) have actually criticised some of the work in this area for its failure to consider information on the labour market histories of individuals. Clark and Oswald (1994) report that unemployment duration in their cross-section has a very small positive impact on well-being conditional on being unemployed. Clark (1996) finds in his panel data that those remaining unemployed do tend to experience a fall in well-being though the effect is rather small compared to the impact of becoming unemployed. Winkelmann and Winkelmann (1998) find no evidence of satisfaction changing over a spell of unemployment. What this suggests is that there is a large depressing effect when workers first become unemployed but not much may happen after that.

The evidence on links between crime and joblessness also suffers similar difficulties, namely problems of causation and not much work that considers potential links between crime and the length of joblessness. The exception to this is work which considers crime and labour force status as reciprocally related so that a cycle develops whereby involvement in crime reduces subsequent employment prospects which then raises the likelihood of participating in crime (see Thornberry and Christensen, 1984). In this vein Freeman (1992) and Grogger (1992) show some association between the persistence of joblessness and crime. Fagan and Freeman (1997) also review evidence that show important links between unemployment and crime but also that factors (like attitudes to crime and increased relative deprivation whilst unemployed), may well underpin these links. They also stress the fact that, over time, many criminal offenders seem to switch between legal and illegal work which would make it hard to identify any strong link between the duration of unemployment or non-employment spells and crime incidence. It should be emphasized again that it is difficult to distinguish between heterogeneity and true duration dependence as the explanation for these correlations.

From this discussion it seems that there is evidence of deterioration of physical and mental well-being for individuals who experience unemployment spells. This is very important for the equity concerns that one might have about long term unemployment and its consequences. Whilst it is rather hard to put a precise timing on when any deterioration of personal well-being occurs during unemployment spells (this clearly requires more research to be done) the fact that unemployment may well have such harmful effects means that falling exit rates from unemployment at all durations may well also have important implications for health and social dislocation.

6. Policies for the Long-Term Unemployed

Concern about the plight of the long-term unemployed has generated many policy proposals designed to alleviate it, some of which have been put into practice. Policies to help the long-term unemployed may be put into four broad categories:

i) policies to help the long-term unemployed with their job search
ii) policies to provide subsidies and/or reduce taxes on the employment of the long-term unemployed
iii) policies to provide or subsidise training of the long-term unemployed
iv) direct employment creation by the public sector

These policies generally have both 'carrot' and 'stick' aspects to them, sometimes encouraging certain desirable behaviour, sometimes sanctioning undesirable behaviour. Issues about the effectiveness of these programmes is discussed elsewhere in the Handbook (see the Chapter by Heckman, LaLonde and Smith) and we will not provide further discussion here. Rather we will concentrate on the principles behind such policies. Arguments for policies specifically designed to help the long-term unemployed are based either on equity or efficiency arguments. The equity arguments are straightforward: the long-term unemployed are among the poorest, most disadvantaged groups in the labour market and policies to assist them can be justified on redistributive grounds. Of course, this says nothing about the form that such help should take: that needs to be decided by reference to the evidence on the effectiveness of different sorts of programmes.

Given this, we will concentrate on the efficiency arguments for policies to help the long-term unemployed. Such an argument must be based on some presumed inefficiency in the way the labour market would operate in the absence of such policies: these inefficiencies generally take the form of an externality of some form.

We have already examined models in which these externalities exist. In the section on the wage curve, we have already discussed why improving the employment prospects of the long-term unemployed relative to the short-term unemployed may have beneficial effects on the wage curve, allowing the economy to operate with a lower overall level of unemployment. The externality here is that individual employers, when deciding who among the unemployed to hire, do not internalise the impact their decision has on the employment prospects of workers in other firms who are deciding whether to shirk or not. This externality, if important, could obviously be used as the foundation for a policy designed to help the long-term unemployed.

There are other examples of externalities, perhaps the most commonly heard of which is the 'flower shop' story. When buying a bunch of flowers customers will generally choose the freshest, least wilted bunch. This has the unfortunate consequence of making the wilted bunches look even sadder when the next customer arrives making them even less likely to be chosen. The analogy to employers choosing from among the unemployed is clear. But, this argument is often not formalised and it is not so clear when one thinks about it that the argument holds water.

To make things more precise, consider the following simple problem. The productivity of workers leaving unemployment, y, depends on their duration t according to the function y(t).[14] It is natural to assume that y is decreasing in t so that the unemployed workers wilt. But, as we shall see, it is the second derivative of y(t) that is going to be important in determining the optimal policy. Suppose that the aim of the government is to maximise the average productivity of those leaving unemployment (i.e we have a pure efficiency objective). We will assume that the government can freely choose the outflow rate from unemployment h(t) but subject to a constraint on the average outflow rate. If one thinks of the inflow into unemployment as being constant, this constraint can be thought of as requiring the aggregate unemployment rate to be constant. So, we are interested in the answer to the question: what duration structure of unemployment would

14. Note that we could do an identical analysis if we assumed that y(t) represented the well-being of unemployed workers.

maximise the average productivity of those leaving unemployment for a given average unemployment outflow rate? Formally, the government can be thought of as choosing the density of completed spells of unemployment, f(t), to solve the following problem:

$$\max \int_0^{\infty} y(t)f(t)dt$$

$$s.t. \int_0^{\infty} tf(t)dt \leq \mu \qquad \textbf{(23)}$$

$$\int_0^{\infty} f(t)dt = 1$$

$$f(t) \geq 0$$

The solution, in certain circumstances, to this problem follows.

Result 3:

a. If y''(t)<0 for all t, then it is optimal to have no short-term workers leave unemployment but all workers to leave once they reach a certain duration.

b. If y''(t)>0 for all t, then it is optimal to have a small group of workers who are permanently unemployed and everyone else to leave unemployment immediately on exit.

Proof: See Appendix.

Result 3 suggests that policies to help the long-term unemployed can only really be justified in this framework if one thinks that the productivity of the unemployed declines at an ever-increasing rate. If, on the other hand, productivity declines with unemployment duration but at a decreasing rate then the optimal duration structure is to have a small group of workers who never leave unemployment and everyone else to leave the instant they enter unemployment. Relative to the existing duration structure this would mean encouraging the outflow of the short-term unemployed. The intuition for this result is simple. If one wants to maximise the productivity of those leaving unemployment one wants to ensure that those whose skills are going to deteriorate fastest are most likely to leave. If the productivity of the long-term unemployed is low but not going to sink any lower there is no urgency in getting them back to work.

Given this result it becomes critically important to know how exactly productivity varies with a spell of unemployment. As we have seen in an earlier section, we have surprisingly little information on this topic. But an educated guess might be that productivity falls slowly initially but there is then a period in which deterioration is rather rapid and then it bottoms out. In formal terms this would mean that y(t) is first convex and then concave. The optimal policy in this case would be to ensure that workers leave unemployment in the period of the most rapid deterioration of their skills.

This would suggests that policy should be targeted not on those workers whose skills and

state of mind are at their lowest ebb but on those about to enter that state. Prevention rather than cure might be one way of putting it. It seems implausible that the type of argument used here can justify focussing policies on the very long-term unemployed though equity considerations would mean that they would probably have to be included in any policy proposal. It should also be remembered that the argument here has been in terms of optimal steady-state policies: if one is starting from a position with a large stock of the long-term unemployed then a policy of clearing the stock is likely to be more easy to justify.

In this brief discussion we hope to have shown how efficiency arguments for helping the long-term unemployed are not as straightforward as they are often made out to be, though more work on this issue is clearly needed.

7. Conclusions

There is no doubt that the high level of long-term unemployment in Europe is a serious problem, consigning many millions of people to misery with little prospect of improvement in their lot. A much higher proportion are now long-term unemployed than used to be the case and the proportion is higher in most European countries than other countries, notably the United States.

In this paper we have tried to explain these stylized facts. Our conclusion is the LTU is more widespread now than in the 1960s because of a collapse in the outflow rates from unemployment at all durations. What evidence there is (and it is not as thorough as one would like) suggests that the long-term unemployed have always been at a disadvantage in finding work and that this duration dependence has not worsened over time. Differences in the average exit rate from unemployment across countries are also important in explaining differences in the incidence of LTU though differences in the inflow rates into unemployment are also important. It is not clear that duration dependence in the exit rate from unemployment is worse in Europe than, say, the US though, again, more evidence on this would be very welcome.

One should not conclude from this that long-term unemployment is not a particular problem in Europe. The sheer numbers of people unemployed for long periods of time means that, if these individuals are less effective in competing for jobs, then unemployment is likely to be much more persistent in Europe thereby making it hard to reduce the level of unemployment.

Table 1
The Incidence of Long-Term Unemployment in OECD Countries, 1995

	Survey-Based		Administrative		
	Proportion Unemployed More Than 6 Months	Proportion Unemployed More Than 12 Months	Proportion Unemployed More Than 6 Months	Proportion Unemployed More Than 12 Months	Standardised Unemployment Rate
Australia	51.4	30.8			8.5
Austria	30.0	17.4	28.2	16.0	
Belgium	77.7	62.4	74.5	56.7	9.4
Canada	27.1	13.8			9.5
Denmark	46.6	27.9			7.2
Finland	47.4	32.3			17.1
France	68.9	45.6			11.6
Germany	65.4	48.3	52.6	33.2	8.2
Greece	71.9	50.9			
Ireland	78.4	62.5	65.7	48.4	12.9
Italy	79.4	62.9			12.2
Japan	38.2	18.1			3.1
Luxembourg	47.5	22.4			
Netherlands	74.4	43.2	78.0	61.0	6.5
New Zealand	38.8	22.9			6.3
Norway	43.3	26.5			4.9
Portugal	62.3	48.7		49.5	7.1
Spain	72.2	56.5			22.7
Sweden	35.2	15.7			9.2
Switzerland	49.6	32.3			3.3
UK	60.7	43.5	56.1	37.5	8.7
US	17.3	9.7			5.5

Notes:
1. Survey-based measures and unemployment rates are from OECD Employment Outlook, as are some administrative figures. Others are taken from country-specific sources.
2. Irish data is 1994 not 1995.

Table 2
Incidence of LTU in the Great Depression

Sample	Source	Proportion Unemployed more than 6 months	Proportion Unemployed more than 12 months	Unemployment Rate
Australia (1939) Men	Eichengreen and Hatton (1988)	44.4	25.3	8.8
Belgium (1937) Men	Eichengreen and Hatton (1988)	61.1	50.4	11.5
UK (1938) Men	Eichengreen and Hatton (1988)	37.7	25.7	12.9
US (1940) Men	Eichengreen and Hatton (1988)	55.0	33.6	25.2
Massachusetts (1934) Men	Margo (1991)	76.6	62.6	

Table 3
The Composition of Long-Term Unemployment in OECD Countries

	Men	Women	Youths	Prime-age	Older workers	Low education	High education
Australia	34.2	25.6	19.3	28.3	49.5	27	20
Austria	17.4	17.4	5.1	16.4	30.3		
Belgium	61.4	63.2	50.4	75.3	78.8		
Canada	15.5	11.5	5.8	11.7	19.0		
Denmark	31.9	24.8					
Finland	35.4	28.7	2.7	20.6	40.3	11	5
France	44.5	46.6	36.4	49.4	70.3		
Germany	45.6	50.9	12.9	30.5	49.5		
Greece	42.0	57.4					
Ireland	66.8	55.3	29.8	47.7	57.0		
Italy	61.9	63.9					
Japan	23.9	9.9	8.8	14.7	24.6	21	8
Luxembourg	24.5	20.6					
Netherlands	48.6	37.9	40.9	62.5	75.4		
New Zealand	26.8	18.0				21	20
Norway	28.6	17.3	1.1	7.9	23.5	20	16
Portugal	46.2	51.2					
Spain	50.7	62.2	56.3	57.0	57.5	49	57
Sweden	17.2	13.6	1.8	4.6	20.2		
Switzerland	32.3	35.4					
UK	49.5	32.2	27.3	44.5	55.6		
US	11.0	8.1	4.5	9.9	14.8	6	6

Notes:
1. The figures refer to the proportion of the unemployed in the relevant category who have been unemployed more than a year.
2. Incidence of LTU by gender come from OECD Employment Outlook and refer to 1995 with the exception of Ireland which refers to 1994.
3. Incidence of LTU by age comes from OECD (1987) and refer to data from 1986. Youths refers to those aged 15-24, prime-age to those aged 25-44 and older workers those aged over 45. Note there are some small differences in the age definitions in some countries.
4. Incidence of LTU by education comes from OECD (1993) and refer to data from the early 1990s.

Table 4
Changes in the Duration Structure of Unemployment

	average duration of unemployment (months)		duration dependence	
	1960s-1970s	1980s-1990s	1960s-1970s	1980s-1990s
Belgium	6.2 (0.07)	15.1 (0.06)	0.39 (0.002)	0.58 (0.002)
France	3.6 (0.01)	12.7 (0.01)	0.54 (0.001)	0.93 (0.001)
Germany	4.2 (0.01)	5.3 (0.01)	0.86 (0.001)	0.58 (0.001)
Netherlands	2.4 (0.01)	13.7 (0.04)	0.68 (0.002)	0.66 (0.002)
Spain	2.3 (0.37)	17.7 (0.17)	0.58 (0.06)	0.91 (0.01)
UK	0.8 (0.14)	6.5 (0.36)	0.35 (0.02)	0.57 (0.02)
Australia	1.2 (0.22)	6.5 (0.56)	0.72 (0.10)	0.79 (0.10)
US	1.1 (0.04)	1.2 (0.03)	0.61 (0.01)	0.52 (0.01)

Notes:
1. These estimates refer to the parameter estimates from fitting a Weibull duration model to the duration structure of unemployment.
2. Standard errors in parentheses. Note that these are extremely low because the effective sample size is the total number of unemployed in the sample years. They should be treated with caution as the Weibull model is used here as a simple way of describing the data rather than the correct model for the duration structure of unemployment.
3. The exact periods used are: Belgium, 1965-70 and 1988-93; France, 1968-73 and 1990-95; Germany, 1971-75 and 1990-95; Netherlands, 1965-70 and 1983-88; Spain, 1965-70 and 1990-95; UK, 1965-70 and 1990-95; Australia, 1965-70 and 1988-93; US 1967-72 and 1982-87.

Table 5
Estimates of Duration Dependence from Raw Data, 1995

Country	Average Duration of Unemployment	Duration Dependence, a
Austria	5.6	.59
	(1.3)	(.08)
Belgium	15.3	.58
	(3.3)	(.08)
Denmark	3.3	.49
	(1.0)	(.07)
France	7.7	.62
	(.50)	(.02)
Finland	5.6	.54
	(1.1)	(.06)
Germany	12.4	.70
	(.7)	(.03)
Ireland	16.8	.59
	(5.1)	(.11)
Italy	26.0	.91
	(1.3)	(.05)
Netherlands	16.5	.75
	(2.1)	(.07)
Portugal	15.4	.99
	(2.2)	(.14)
Spain	14.9	.66
	(.9)	(.03)
Sweden	10.1	1.60
	(.8)	(.18)
UK	6.4	.48
	(.6)	(.02)

Notes:
1. The data for these estimations are taken from the 1995 Eurostat Labour Force Survey.
2. The parameters are estimated using the data on the duration structure of unemployment. Standard errors are reported in parentheses below.