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Abstract We argue that equilibrium unemployment has varies in the UK over the last twenty years, and that time series econometric methods have not always been suited to uncovering its evolution. Recent changes in the UK labour market seem to have had a significant impact on equilibrium unemployment, partly through a reduction in prime age participation. We calculate equilibrium unemployment using flows between employment, unemployment and inactivity for prime age members of the work-force. Labour market transitions do appear to have been eased by the acquisition of skills amongst the unemployed in the 1980s and 1990s, offsetting some of the potential effects of skill biased technical progress. Equilibrium unemployment may have fallen by up to two pints in the 1990s as compared to the late 1980s. We would judge that the UK has been close to equilibrium employment since late 1996.

[1] This paper is in a provisional form, and the authors regret errors and omissions, but accept that they could be present. We would like to thank Paul Gregg for stimulating us to do this work.

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I Introduction

The concept of equilibrium unemployment is one of the most heatedly discussed in economics. Its level, the correct way to measure it, and even its very existence, are continually discussed, as can be seen from the papers in the Winter issue of *Journal of Economic Perspectives* in 1997. This debate is not surprising given the huge changes we have seen in the last fifty years. For much of the period between 1945 and 1970 economies such as the UK were able to experience inflation less than 3% and unemployment around 2%. During the 1980s unemployment almost always exceeded 6% as did inflation. It is important to explain such large changes in behaviour in order to design policies to reduce unemployment.

It is still widely felt that unemployment remains high because the level of demand is too low, and the recent election of left of centre governments in France and Germany have brought this idea back into the centre of the political debate. We argue[2] that this is not the case in the UK, and that although there may be some case for counter-cyclical fiscal policy in countries such as Germany, there is not one to be made for the UK. We look at unemployment and inflation over the last thirty years, and we would conclude that the equilibrium, or sustainable, level of unemployment has risen. However, it is hard to decide what is the new equilibrium, especially when using aggregate data on levels of registered employment and unemployment. The study of aggregate macro-economic history is sometimes revealing, but it can also mislead.

In this paper we first review the concept of equilibrium unemployment at the macro level and then we suggest that a careful analysis of flows in the labour market over the last 5 years can give us information about the equilibrium or sustainable level of unemployment in the UK. There is some evidence that this has fallen since the 1980s, but some of this fall has been reflected in a rise in inactivity, especially among prime age

[2] We make this case in a theoretical context in Barrell, Sefton and Pain (1997) as well as in a more empirical way in Barrell, Morgan and Pain (1996a) and (1995).

males. We suggest that some of the fall is the result of various retraining programmes that were undertaken in the late 1980s and early 1990s.

II The History of Unemployment and Inflation in the UK

Around thirty years ago Friedman introduced the 'natural rate of unemployment'. This concept remains at the heart of the debate. He believed that the sustainable level of unemployment in the economy was the outcome of market forces, and depended on the structure of labour and product markets and on the process of search in the economy. Equilibrium could be achieved only when expectations of prices were correct, otherwise different decisions about supply would have been made. If output and employment were above that determined by the market equilibrium then prices and wages would rise more rapidly than people expected. Conversely if output and employment were below market equilibrium levels, prices would rise less rapidly than people had expected. This concept is related to the NAIRU (the Non Accelerating Inflation Rate of Unemployment) popularised by Layard, Nickell and Jackman. Their work is encompassed in their book (Layard, Nickell and Jackman (1991)) and has been the basis for many studies of unemployment and wage determination in Europe.[3]

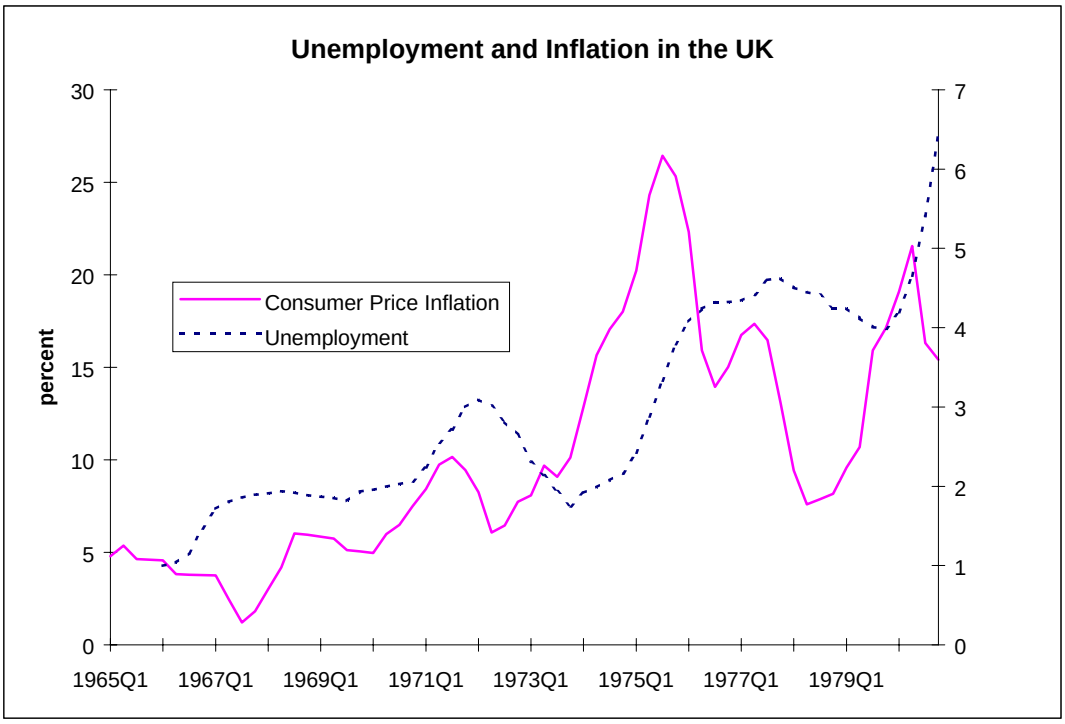


Chart 1: Unemployment and inflation in the UK, 1965- 1980

[3] See e.g. Barrell, Pain and Young (1993) and Anderton and Barrell (1995).

This simple insight was very controversial. Keynesian economists had become convinced that there was a trade off between output and inflation, even in the long run. Politicians had begun to be persuaded that if they raised the rate of growth of demand they could have permanently lower unemployment. The boom in the UK in the early 1970s (the Barber boom) can be seen as a belated attempt to exploit this trade-off. This episode is clear in Chart One which plots inflation and unemployment in the UK in the 1960s and the 1970s. In 1966-7 unemployment rose and inflation fell, much as we would expect. Unemployment rose again in the early 1970s, and inflation, which had been rising, subsided somewhat in 1972. The level of unemployment fell again shortly after, driven down by the fiscal and monetary policy actions that were generating the Barber boom. Inflation then rose rapidly in the UK and elsewhere reaching 25% in 1974-5, partly driven by the shock to oil prices, and unemployment needed to be increased a lot to reduce it. The cycling of output and unemployment is consistent with a belief in a constant natural rate of 2% to 3% where booms caused inflation to rise relative to the level expected, and where labour and product markets were slow to react.

The history of the 1980s and 1990s could be told in a similar way, as can be seen from Chart Two. At the beginning of the decade unemployment was rising, and as a result of the associated low level of demand, inflation was falling. Between 1983 and 1987 inflation fluctuated between 3% and 7%, and unemployment remained stubbornly high. The Chancellor stimulated a post election boom in 1987, fuelling already strong demand. Unemployment fell sharply through to 1990, and inflation rose. The very rapid fall in unemployment may have increased the pressures on prices as markets were not being given time to adjust. Inflation only began to fall after another sharp rise in unemployment from late 1990 onwards.

This sounds a similar story to the 1970s, with booms and recession generated by policy or by outside events. However, unemployment was almost always above 6%, and if we use the simple view of the natural rate of unemployment implied in our stories, it must have risen rather a lot between the 1970s and 1980s. Work at the National Institute, reported below, suggests that it could have been between 8% and 9% over this period.

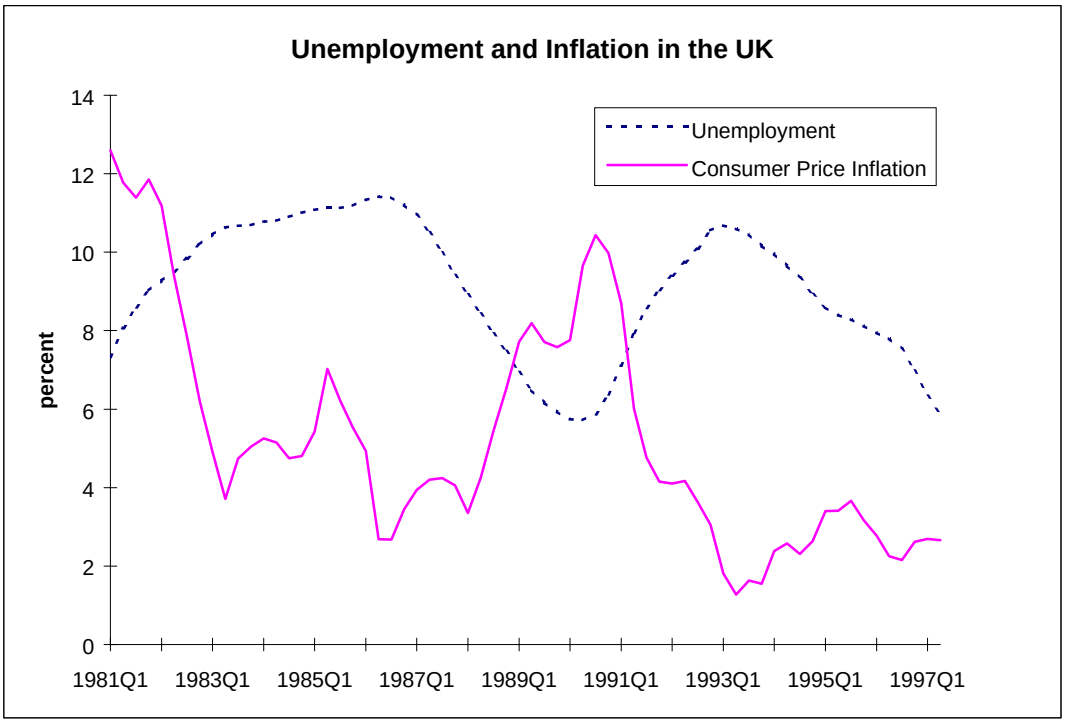


Chart 2: Unemployment and inflation in the UK, 1981 - 1997

III The Determinants of Equilibrium Unemployment

The rise in measured unemployment was matched by most European economies, but not by the US. Many explanations have been advanced for this phenomenon, some more convincing than others. The most commonly discussed is that the European labour markets lacked 'flexibility' and could not cope with changes to the world environment. The OECD in its *Jobs Study* (1994) stresses the importance of labour market flexibility, and they look extensively at the causes of unemployment, and these issues have been the subject of extensive academic study. It is possible that employment protection legislation and related redundancy rules slow down the adjustment of individual firms to changes in demand, and hence make the economies of Europe less flexible, as we find in Barrell and Morgan (1998). Trade Unions may also make sectoral employment shifts more difficult to undertake, and hence they may slow the adjustment to a changing pattern of demand. However, in neither case would we expect such institutions to raise the level of equilibrium unemployment in the economy unless either they themselves or the environment in which they work changed in some material way.

The rise in unemployment in Europe can either be explained by a change in the equilibrium level, or by an appeal to very slow adjustment to

changing circumstances, as is argued in Bean (1994). The latter is a possibility, especially given employment protection would slow down adjustment. However, the timescale of adjustment needed to explain high unemployment for over a decade seems rather extended. If the rise in unemployment is explained by a shift in the equilibrium rate then we have to ask what changed in Europe to change the equilibrium. The usual suspects are minimum wages, unemployment benefits and trade union bargaining power. We have investigated these and other forces at work in Barrell, Pain and Morgan (1996) where we estimate the determinants of unemployment using aggregate data over a long time period.

Minimum wages, especially if applied at a high level across all occupations, sectors and regions, could easily raise the wage floor below which jobs were not available, and hence remove the opportunities for some individuals to take paid work. In France, for instance minimum wages have become more generous relative to the average over the last 25 years, and this could easily raise equilibrium unemployment. However, this trend in minimum wages has not been common in Europe, whereas the rise in unemployment has been. Of course, each country could have its individual explanation, but this would leave the search for a single cure without a solution.

Unemployment benefits were initially designed to support individuals in spells of unemployment, partly to support their incomes, and partly to support their job search. Benefits were meant in part to improve the matching of workers to jobs, and hence improve the efficiency of the economy. However, one side effect of this would inevitably be that spells of unemployment would be lengthened by more generous benefits. As a result we would expect that higher benefits would be associated with higher levels of unemployment and longer individual spells of unemployment. Given how strong the theoretical support for a role for benefits in determining equilibrium unemployment, it is surprising that it has been difficult to find a role for them in empirical studies. However, once again, in France benefits have become more generous over the last 15 years and unemployment has been rising. The reverse is true for the UK.

Trade unions did become stronger in the 1970s, and this may help explain the strong growth in real wages that we see in chart three over the period 1976 to 1979. If bargaining power on behalf of ‘insiders’ increases, then real wages are likely to be pushed up, at least for these

workers. At higher real wages firms would probably find that they had to cut employment, and some insiders would leave that market segment dominated by trade union employment. The options available to them might include longer spells of unemployment or low paid work. In either circumstance we would expect to see sustainable or equilibrium unemployment rising. This story is appealing, but only has statistical backing in a limited number of countries. In some, such as Germany and France, it is difficult to ascertain an increase in union power in the early 1980s. In other, such as the UK, union power began to decline in 1980, but this decline had little effect on equilibrium unemployment.

What else might have driven rising unemployment in Europe? Domestic monetary policies in Europe in the early 1980s were very restrictive, raising the real rate of interest firms had to pay on borrowing. Phelps (1993) and Manning (1993) argue that there is strong theoretical and empirical evidence that real interest rates have a permanent effect on equilibrium unemployment. For instance high real rates would induce firms to shed surplus stocks to save on borrowing costs. Surplus stocks are designed to cover unexpected demands, and in the early 1980s they would have included stocks of goods for immediate sale and stocks of surplus staff immediately ready to produce when demand rose. Sustained high real interest rates would cause firms to shed both types of surplus stocks, and tight policies sustained for nearly a decade may well have held equilibrium unemployment higher than it world otherwise have been.

The 1979 rise in oil prices could itself have been a cause of the increase in unemployment, as Carruth Hooker and Oswald (1993) suggest. The shock disrupted output, and caused a major change in the nature of production. In particular it caused producers to shift out of energy intensive production methods, and this appears to have changed the demand for labour and hence the equilibrium level of employment. However, the argument by Layard and Nickell (1985) that there had been a sustained rise in equilibrium unemployment in the early 1980s were probably exaggerated, as Barrell (1993) argued, because there was not a full appreciation of the lags involved in European labour market adjustment. This is especially the case in adjustment to the oil shock as whole vintages of capital had to disappear before it was complete.

In the 1980s changes to benefits, trade union powers and other reforms in the UK should all have been driving down equilibrium unemployment, but we did not see unemployment fall consistently. Meanwhile in the

US, where there is virtually no social safety net, unemployment was stable but inequality was rising. Inequality in the UK also began to rise, but at a later date. The continental Europeans maintained their social safety net and corporatist bargaining, and their unemployment tended to continue to rise over the 1980s. A constant threshold of support set at some proportion of average wages seemed to be catching more people. Various factors may have been at work, such as changing technology and competition from East Asia in particular. These factors may have been widening the distribution of incomes that were potentially available, and in particular reducing the relative potential wage of those with low skills. In the support-less US (and UK) inequality would rise as a result but unemployment would not, whereas in the supported continent unemployment would rise. This is a convincing argument, but it is difficult to find as much support for it as we would like as statisticians, although Machin (1997) does make a case. However, it is likely to be part of the explanation of what we observe, and may help us formulate policies to reduce unemployment. In particular, if we have seen some skill bias in the changing pattern of demand for goods or in technical progress, one obvious policy response is to work on reskilling the population. This is indeed what the UK was doing during the 1980s and early 1990, and it may have affected equilibrium unemployment, and we discuss this below.

IV Has Equilibrium Unemployment Changed?

The experience of the 1980's and the early 1990's suggested that the equilibrium level of unemployment had proved remarkably resistant to the changes in benefits and the legal rights of trade unions. However, the mid 1990s do not look like the previous 20 years. Chart Three plots the growth of the real wage received by workers (net of taxes) over the last 25 years. There are clear cycles, with the recession years of 1975—77, 1981 and 1991 showing falls in real wages. In general they tend to grow strongly in upswings. Real wage growth was particular strong between 1977 and 1980, perhaps explaining the rise in sustainable unemployment between the beginning and the end of the 1970s. The slower upswing following the 1981 recession was also accompanied by gradually increasing real wage growth. This was to be expected in a period of stable or falling unemployment, as our discussion above suggests. A similar pattern of rising real wages is observable in the early stages of the 1990s recovery, but from late 1992 real wage growth is remarkably subdued given the relatively steep falls in unemployment that we can see in Chart Two.

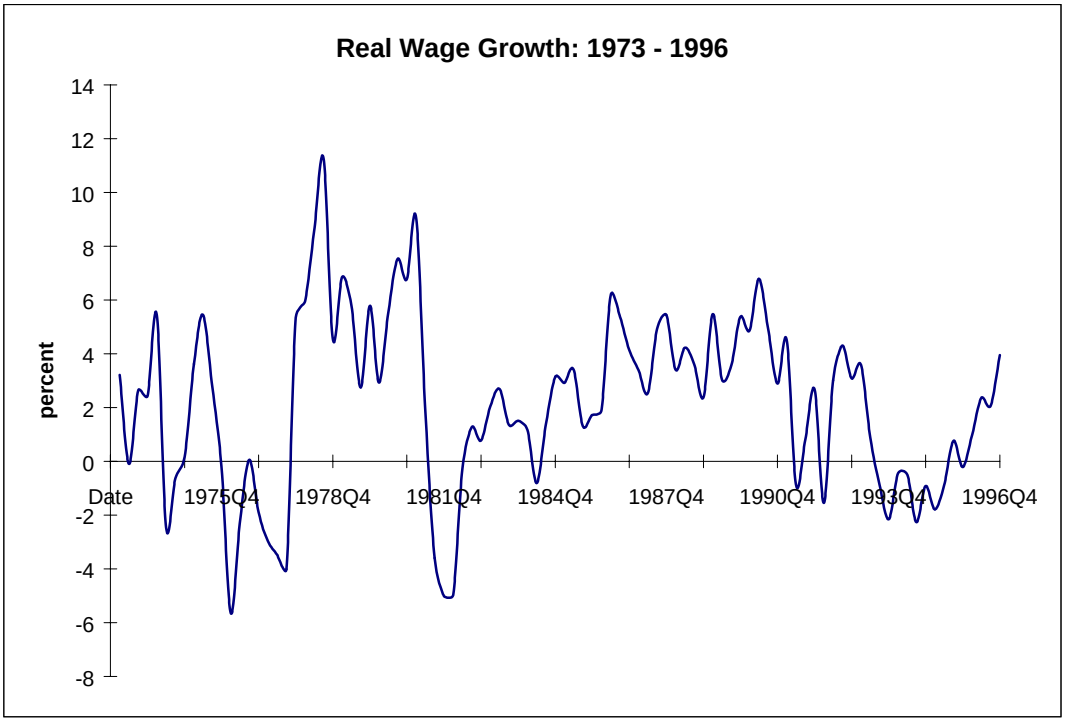


Chart 3: Annual growth in real wages received by workers

Our graph makes the potential change in behaviour reasonably clear. However, the techniques used to estimate the equilibrium levels of unemployment we have already discussed are not particularly well suited to picking up change at the end of the time period they use. There is evidence in the DfEE report on *Labour Markets in Recovery* (Barrell and Morgan (1996)) that the UK was beginning to behave differently. The statistical work that backed up that report (Morgan 1996a and 1996b) suggested that the level of unemployment had started to have a more significant impact on real wages after 1992 than before it. It is difficult to draw firm conclusions from a (statistically significant) change that cover only the last four years of the 25 or so used in the research. However, it is possible to investigate the potential changes in behaviour by other methods.

V Using Information on Labour Market Flows

In the approach outlined above, equilibrium unemployment is assessed using information on the stock and the *net* change in the stock of unemployed. Using another approach in this section, we estimate equilibrium unemployment using information on *gross* worker flows. At any point in time, irrespective of whether the unemployment level is stable or not, the labour market is characterised by workers moving in

and out of the labour force and between unemployment and employment. The magnitude of these flows varies over the business cycle. The number of workers moving between unemployment and employment increases in times of recession,[4] whereas the reverse pattern holds for flows between inactivity and employment.[5] To derive an estimate of equilibrium unemployment we need to use flow data from a period where the economy appears to be neither in boom nor recession[6].

One of the benefits of looking at gross rather than net changes in unemployment, is that gross flows give a description of the dynamics underlying observed level changes, yielding greater insight into the mechanics of the labour market. Equilibrium flow rates should depend on factors such as the structure of the benefit system, search costs and match efficiency, and the level of wages available. Furthermore, they should depend on the skill and demographic distribution of the population. Hence they should evolve slowly and be directly affected by the structural factors affecting unemployment.

Estimates of labour market flows are obtainable from information in the Labour Force Survey (LFS). Survey respondents are questioned on their economic activity at the time of and twelve months prior to interview. Classifying individuals by their answers to these two questions gives estimates of gross worker flows between different states in the labour market in a given year.[7] We can define four possible labour market states: "employed" (E), “unemployed" (U), "participating in a government employment or training programme" (G) and "economically inactive" (IN). Annual population flows between different states are summarised in a matrix X, where element x_{ij}, $i = 1,...,4$ and $j = 1,...,4$, is the population that moved to state i this year from state j last year. From these population flows, the annual *rate* at which the population moves from state j to state i is simply $q_{ij} = x_{ij} \Big/ \sum_i x_{ij}$. The columns of matrix

[4] Note that flows refer to aggregate numbers here. The cyclical pattern of aggregate flows does not translate directly to flow or transition rates.

[5] See Blanchard & Diamond (1990) and Davis *et al*. (1996) for the US and Burda & Wyplosz (1990), (1994) for France, Germany and the UK.

[6] In doing this we follow the pattern of analysis in Blanchflower and Freeman (1993) and extend our analysis in Barrell and Riley (1997).

[7] "Current Economic Activity" and "Economic Activity 12 Months Ago" are not directly comparable as the former is assessed by the interviewer, where the latter is assessed by the respondent. The respondent's own assessment is based on recall, which is likely to introduce further misclassification.

$Q \equiv \left[q_{ij}\right]_{i=1,..,4;\, j=1,..,4}$ sum to one and give the population distribution over states i conditional on state j. Transition rates for the population 16+ and 25+, below retirement age, are given in Table One below using the LFS from spring 1996.

Transition Rates for the Population 16+

	Et-1	Ut-1	Gt-1	INt-1
Et	0.94	0.33	0.25	0.17
Ut	0.03	0.47	0.15	0.06
Gt	0.00	0.03	0.49	0.01
INt	0.03	0.17	0.12	0.76

Transition Rates for the Population 25+

	Et-1	Ut-1	Gt-1	INt-1
Et	0.95	0.31	0.17	0.11
Ut	0.02	0.48	0.15	0.05
Gt	0.00	0.03	0.57	0.00
INt	0.03	0.18	0.11	0.84

Table 1: Transition Probability Matrices (t=1996)

Column headings refer to labour market status reported last year.

Row headings refer to labour market status reported this year.

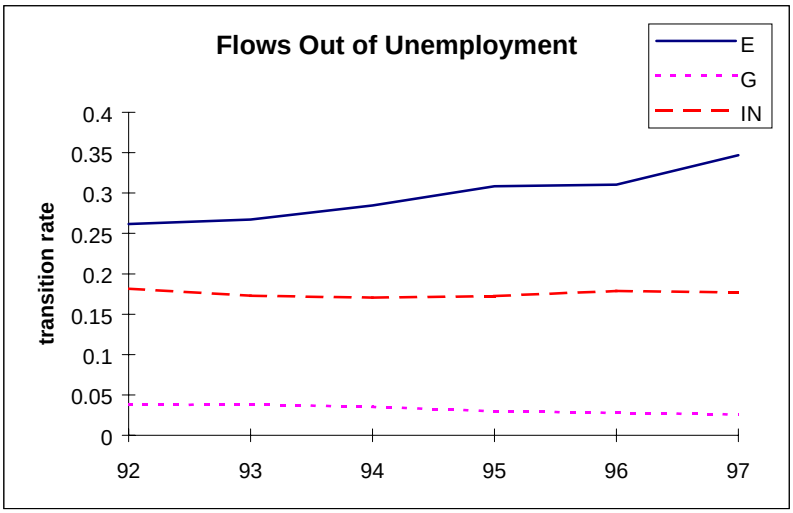
Entries in each column sum to one.

The entry in (Ut-1,Et) gives the transition rate from unemployment to employment.

The most noticeable difference in transition rates between the two populations is the difference in the exit rate from inactivity, at 0.24 and 0.16 for the 16+ and 25+ year olds respectively. This is partially due to the large proportion of young people entering the workforce from education.[8] Most of the difference in the exit rate from inactivity is due to the transition rate from inactivity to employment, which at 0.17 for the 16+ group is much higher than 0.11 for the 25+ group. However, part of the difference is due to misreporting. A disproportionately large number of the 16-24 year olds have replied to the LFS by proxy.

[8] This is particularly important for the early 1990s when participation in higher education amongst the under 25s rose rapidly.

4(a)



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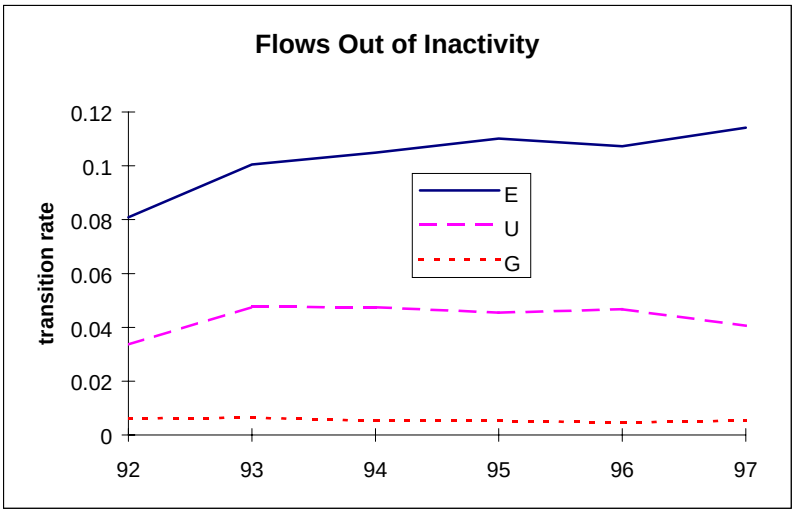

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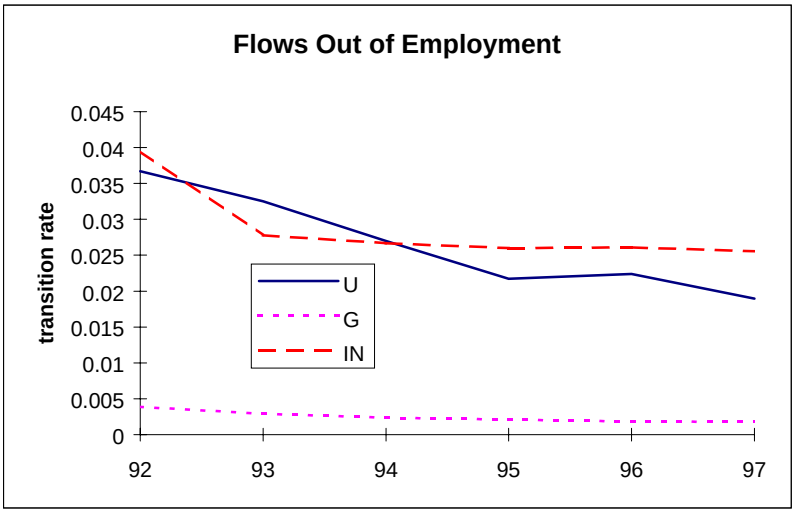


Chart 4: Flows out of unemployment, inactivity and employment

Comparing the population distribution across states implied by the response to "current economic activity" in year $t-1$ with the distribution implied by the response to "economic activity 12 months ago" in year t, we get an idea of the extent of misreporting. The two distributions should be roughly similar. For the population 16+, "economic activity 12 months ago" measured in year t systematically gives higher inactivity rates than "current economic activity" measured in year $t-1$. As a result, the exit rate from inactivity is overstated. Excluding the 16-24 year olds significantly, and almost entirely, reduces this problem (see chart 5). Hence we proceed with the data for the population 25+ below retirement age.

Transition matrices for this group are reported in Appendix A for each year between 1992 and 1997.[9] These understate the dynamics of the labour market. People who were unemployed at times t and $t-1$ are counted as never having left unemployment, although it may be the case that they have been in and out of employment during the period. There are two immediate ways of reducing this problem. Firstly, by increasing the frequency at which flows are measured, e.g. monthly or quarterly rather than annually. Secondly, one can use duration data to measure gross flows. Following Davis *et al.* (1996), gross flows into unemployment between times $t-1$ and t are measured as the number of unemployed at time t reporting an unemployment spell of less than one period. Gross flows out of unemployment are measured as the number of unemployed at time $t-1$ less the number of unemployed at time t reporting an unemployment spell of more than one period. Using this approach, the exit rate from unemployment between spring 1995 and 1996 for the population 25+ below retirement age is 0.57, compared to an exit rate of 0.52 in Appendix A. Using the duration data alone, we have to group E, G, an IN into one state, hence we stick with our current approach. Charts four a, b, and c plot the transition rates implied by the matrices in Appendix A.

VII Equilibrium Unemployment

To arrive at an estimate of equilibrium unemployment a few assumptions are necessary. Assume that transition rates between different states in the labour market are independent of time and independent of previous and current population distributions across states in the labour market.

[9] The definition of unemployment provided by the International Labour Office is used throughout the paper, hence the flow rates are not comparable with flows in and out of claimant unemployment.

Letting the vector x_t describe the distribution of the population across labour market states at time t, the assumptions on flow rates imply that the process $\{X_t\}_{t=0}^{\infty}$ is a Markov chain with $x_t = Q \cdot x_{t-1}$, where Q is as above. It is then possible to derive the steady state distribution or long-run equilibrium distribution associated with Q. The steady state distribution of the population across labour market states is given by x^*, where $x^* = Q \cdot x^*$, and the steady state probability distribution of the population is $p^* = sx^*$, where s is a scalar solving $\sum_i x_i^* = 1/s$.[10]

Steady state distributions associated with each of the probability matrices from 1992 to 1997 are listed below in Table Two along with the actual distribution at the beginning and end of the year in question (e.g. 1996 refers to the flow between spring 1995 and spring 1996).

The steady state distributions vary substantially over the 6 years, with steady state unemployment *as a percentage of the population* decreasing from 7.3 per cent in 1992 to 4.2 per cent in 1997. This is to be expected given the variation of gross flows and transition rates over the business cycle. Clearly these cannot all be useful estimates of long-run equilibrium in the labour market. A useful estimate of long-run equilibrium must be derived from equilibrium labour market dynamics. If the economy is in the midst of boom or recession, flow rates are not at their long-run equilibrium values. Looking at the flow rates illustrated in charts four a, b, and c above, they appear to be stable around 1995 and 1996, a time at which the UK economy is neither in boom nor recession.

If flows are approximately at equilibrium, they do not necessarily imply that stocks are. However, we must expect that the stocks are close to their long-run equilibrium level as well, otherwise, by way of a circular argument, flows should be changing and are therefore not at their long-run equilibrium values. Charts 5 a and b show unemployment and inactivity at time $t-1$, time t and in steady state, corresponding to the

[10] A non-zero x^* exists since $(Q-I)$, where I is the indentity matrix, does not have full rank. To find steady state probability distributions p^* for each year, we calculate the eigenvalues and eigenvectors for each of the probability matrices reported in Appendix A. The eigenvalues and the associated eigenvectors are listed in Appendix B. The eigenvector corresponding to the unit root can be rescaled to arrive at both p^* and x^*. Given that the transition matrix for each year has four real roots, only one of which equals unity both in absolute and numeric terms, the labour market probability distribution converges to steady state p^* from any prior distribution (see Bartlett (1955), p.28).

numbers in table 3. Actual unemployment and inactivity between 1995 and 1996 are not too far from the steady state implied by the flows between these two years. The flows between spring 1995 and spring 1996 suggest that equilibrium unemployment is around 5.2% of the population over 25 below retirement age, around half a point below the level in 1995, and close to that in 1996. [11]

EMPLOYMENT	1992	1993	1994	1995	1996	1997
12 months ago	0.71	0.74	0.74	0.74	0.74	0.75
Currently	0.68	0.73	0.74	0.74	0.75	0.76
Steady State	0.59	0.69	0.73	0.76	0.75	0.77
UNEMPLOYMENT	1992	1993	1994	1995	1996	1997
12 months ago	0.05	0.07	0.07	0.06	0.06	0.05
Currently	0.06	0.07	0.07	0.06	0.05	0.05
Steady State	0.07	0.07	0.06	0.05	0.05	0.04
GOV. PROGRAMME	1992	1993	1994	1995	1996	1997
12 months ago	0.01	0.01	0.01	0.01	0.00	0.00
Currently	0.01	0.01	0.01	0.01	0.01	0.01
Steady State	0.01	0.01	0.01	0.01	0.01	0.01
INACTIVE	1992	1993	1994	1995	1996	1997
12 months ago	0.23	0.19	0.19	0.19	0.20	0.19
Currently	0.25	0.19	0.19	0.19	0.19	0.19
Steady State	0.32	0.22	0.20	0.19	0.19	0.18

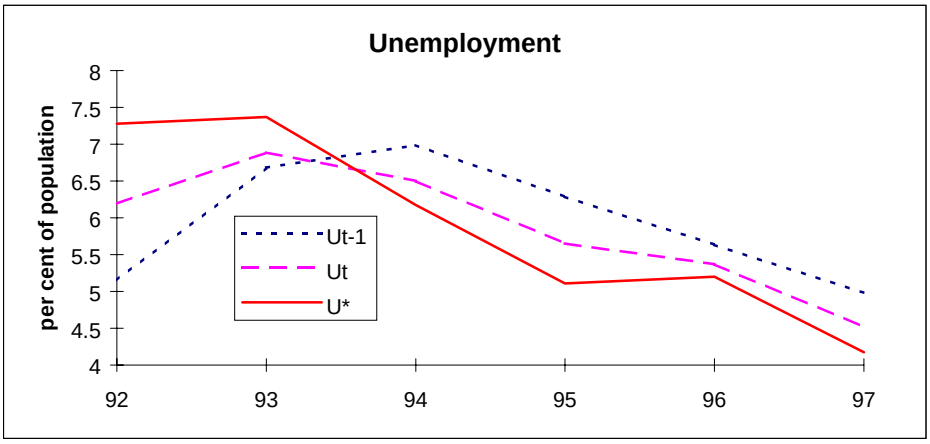
Table 2: Labour market status last year, currently and in steady state

Boom and recession are not the only factors that bring transition rates away from long-run equilibrium. Changes in legislation may also introduce short term disturbances. For example, in October 1996 Unemployment Benefit was replaced by Job Seeker's Allowance, introducing reductions in the size and duration of benefits available for the unemployed. Some respondents categorised as unemployed in 1996 might for purely cosmetic reasons be categorised as inactive in 1997. More importantly, some of the unemployed in 1996 may have been forced to flow into employment in 1997. These changes in flow rates are

[11] Darby et al. (1985) decompose transition rates into a "normal" and a "cyclical" component, using the normal component to estimate the natural rate. However, this is only possible with a longer time series. Blanchflower & Freeman (1994) estimate the natural rate with information on transition rates for one year only.

temporary and do not reflect equilibrium changes, and may be misleading if used to estimate long-run equilibrium.

5(a)



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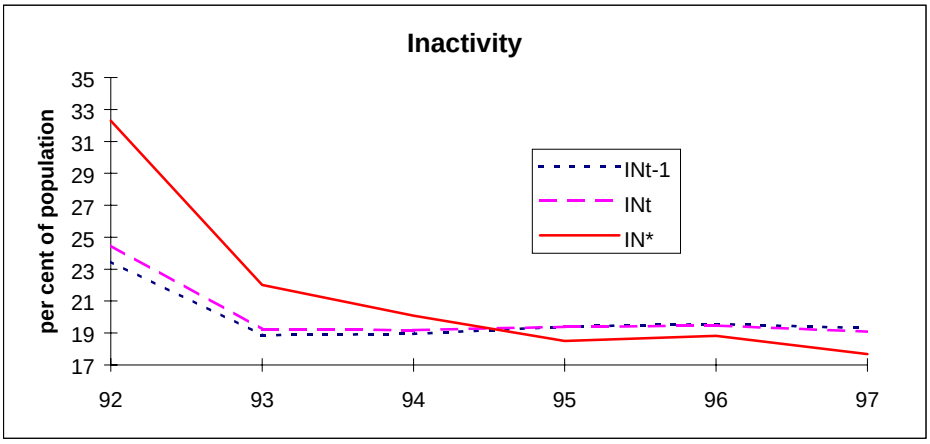


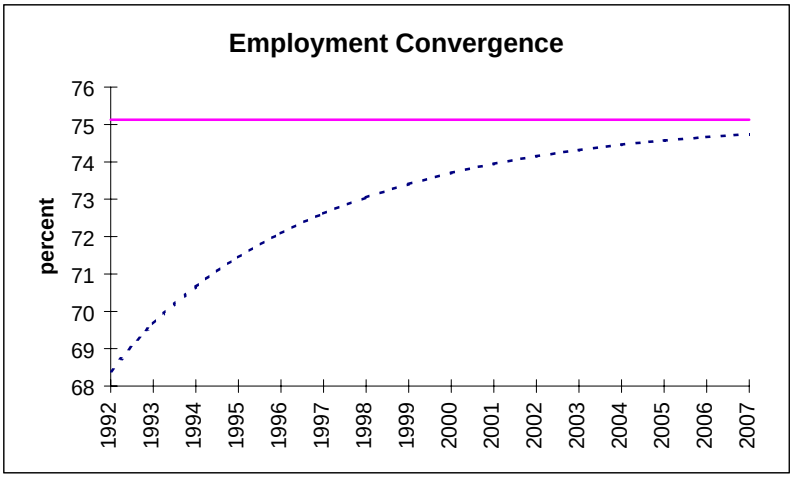
Chart 5: Unemployment and inactivity last year, currently and in steady state

In deriving an estimate of long-run equilibrium unemployment, we assumed that transition rates between states were independent of time and independent of previous and current distributions across states. It is worth noting that the independence assumptions are essentially only applied to "stable" flow rates, since we do not use flow rates in years where the economy is far from long-run trend. Here we mention two problems with the independence assumptions, both arising from the high level of aggregation employed. Firstly, if an individual's probability of exiting unemployment depends on unemployment duration, then the aggregate exit rate from unemployment will depend on the distribution of individual unemployment durations and hence on the history of the aggregate population distribution across labour market states.[12] Secondly,

[12] Microeconomic evidence on the duration dependency of exit rates from unemployment is not conclusive, see Devine and Kiefer (1991). Noting the sensitivity of the results from this research to unobserved individual heterogeneity, Jackman and

gross flow rates vary substantially by age and gender implying that the population's demographic composition in each labour market state is relevant in determining flow rates.[13] This means one cannot necessarily assume that flow rates are independent of time in the context above.[14]

(a)



(b)

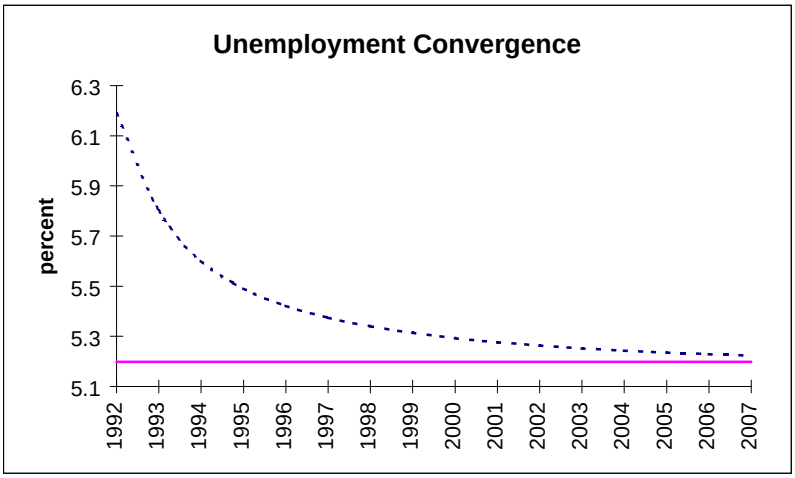


Chart 6: Convergence to steady state employment and unemployment

The extent to which these two issues affect the results is unclear and our results should be interpreted with caution.[15]

Layard (1991) find negative duration dependence using data from 1968-1988 on aggregate quarterly flows of males out of unemployment in Great Britain.

[13] See e.g. Davis *et al.* (1996), Blanchard & Diamond (1990) or Gönül (1992) for differences in gross flow rates by age and gender.

[14] We cannot assume that aggregate transition rates replicate the demographic composition in each state from one period to the next, implying that transition rates at time t and time $t-1$ are equal only by chance.

[15] It is however possible to improve upon both problems within the Markov chain framework. The population's demographic distribution can be taken into account by analysing age and gender groups separately. Duration dependence can be taken into

Despite these cautions, it is interesting to look at the speed of convergence implied by equilibrium flow rates. Charts six a and b illustrate convergence to steady state from a deviation equivalent to the actual population distribution across states in 1992. After seven years, employment has completed almost three quarters of its total adjustment. Unemployment convergence is faster with more than three quarters of its total adjustment complete after only four years. The cyclicality of flow rates implies that the actual speed of convergence is faster.

VIII Has Equilibrium Unemployment Changed?

Repeating this question from above, we are now in a better position to give an answer. In order to judge whether the equilibrium level of unemployment has fallen in the 1990s we compare our steady state unemployment rate for the population 25+ below retirement age with actual unemployment for this group through the 1980s and 1990s. Our steady state (unemployment at approximately six and a half per cent of the workforce) is 2% below the pre 1993 average, and below the level reached at the height of the boom at the end of the 1980s. It is also below steady state unemployment rates for this group calculated on 1979 and 1990 gross flow data. Both of these years and 1996 are at comparable stages in the business cycle. In 1990 steady state unemployment for the 25+ group was around 7.2 percent. We conclude that there has been a change in equilibrium unemployment. Much of the fall in steady state unemployment has been matched by a rise in steady state inactivity. There has not been a significant change in the sustainable level of employment.

It would be useful to understand the reasons for these changes. Have the unemployed merely been classified as inactive? Although equilibrium employment has risen, it has not risen by much. Within the framework above, we would want to investigate which factors influence transition rates in different age and gender groups. Without undertaking such an investigation, we suggest that the reduction in equilibrium unemployment from the 1980s to the 1990s is in part due to an increase in labour force skills.

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account by classifying unemployment (and perhaps employment and inactivity) of different durations as separate states, see Orszag (1997).

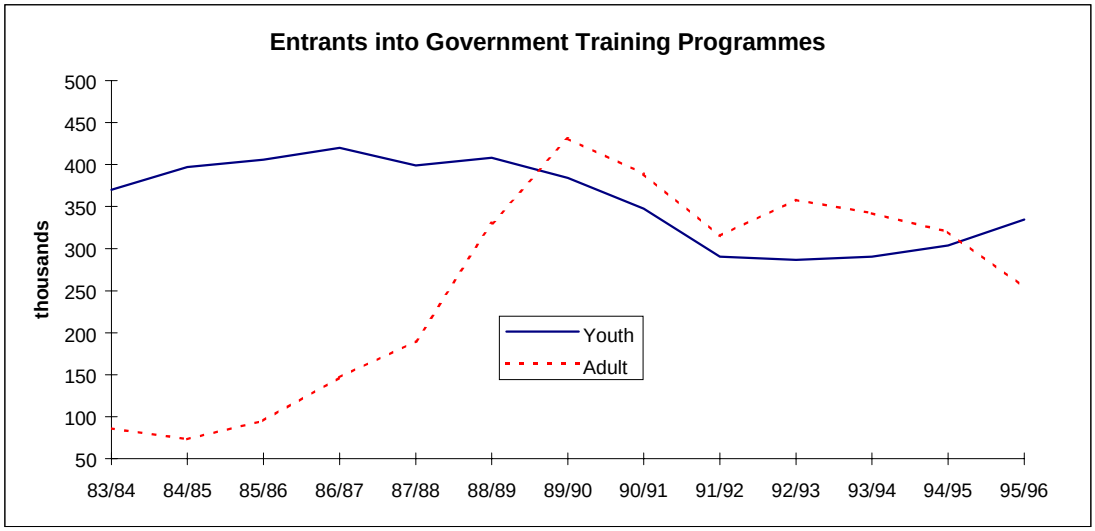

Chart 7: Entrants into government training programmes, Great Britain 83/84 - 95/96

Youth training programmes include Youth Training Schemes (September 1983 to April 1991), Youth Training (from April 1991 onwards), Modern Apprenticeships (from September 1995 onwards). Youth training programmes are available to 16 and 17 year olds leaving school but unable to find work with a local employer.

Adult training programmes include Training Opportunities Programme (83/84 only), Occupational Training (84/85) only, Open Tech (83/84 - 86/87), Old Job Training Scheme (85/86 - 88/89), New Job Training Scheme (86/87 - 88/89), Training Linked to Community Programmes (84/85 - 88/89), Employment Training and Training for Work (from September 1988 onwards), Employment Action (91/92 - 92/93).

Adult training programmes are available to the long-term unemployed age 18 and above.

Data from Table A21 in Training Statistics 1996 by the Department for Education and Employment.

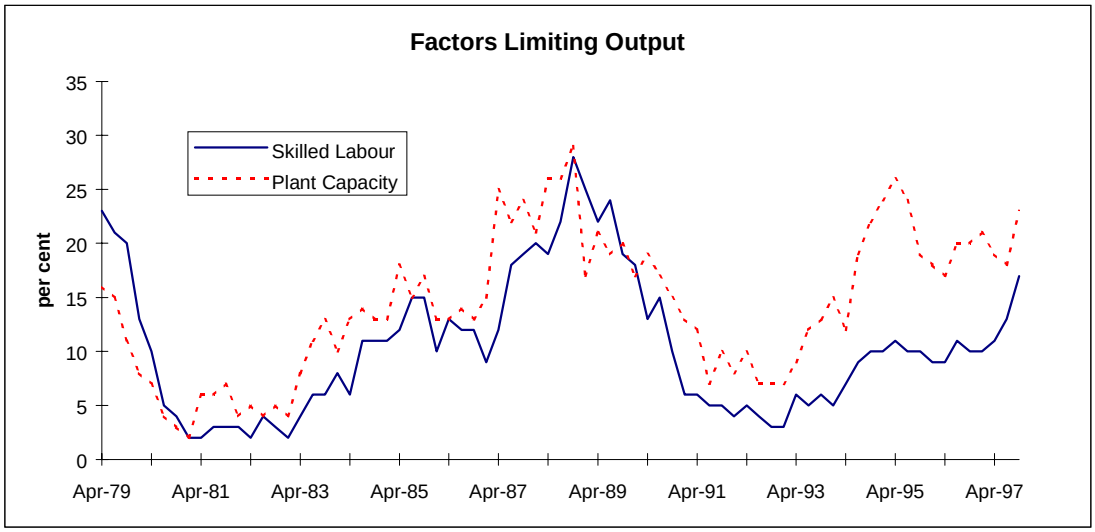

Chart 8: Factors limiting output in UK manufacturing: July 1979 - October 1997

Source: CBI Industrial Trends Surveys

Firms are asked which factors are likely to constrain their output over the next four months. The chart plots the percentage of firms that mention skilled labour and/or plant capacity in reply.

As mentioned in previous sections, there is little coherent evidence that high levels of equilibrium unemployment in Europe in the 1980s can be

explained by factors such as minimum wages, unemployment benefit structures and trade union power, although all these factors undoubtedly do affect equilibrium. Also, there is evidence to suggest that international competition and the introduction of skill-biased technologies increased wage dispersion and/or unemployment in OECD economies during the 1980s. The UK experienced both, due in part to a relatively flexible wage structure and a labour force that did not match the skill levels of its continental competitors. Efforts to raise the skill level of the labour force have been on the agenda since the mid 80s, when government training programmes took hold of the long term unemployed, see Chart Seven. Focus has also been directed towards the importance of higher education, with participation rates rising steadily at the beginning of the 1990s.

That these efforts have contributed to a reduction in equilibrium unemployment would be a natural conclusion to draw. Chart Eight below lends support to this conclusion. Comparing the recoveries of the early 80s and early 90s, we see that firms were slower to report skill shortages relative to shortages in plant capacity in the 90s recovery.

IX Conclusions

The labour market reforms of the 1980s were meant to transform the way the economy performed, but little evidence of improvement appeared during that decade. There is some evidence that equilibrium or sustainable unemployment fell in the 1990s. However, the emergence of inflationary pressures and skill shortages at the end of 1996 made it clear that equilibrium unemployment had only fallen by around 2 percent as compared to the late 1980s. Studies of the 1970s and 1980s using aggregate data do not provide much support for the belief that benefits, unions, and all the other 'usual suspects' were at the root of the rise in unemployment. We argue that the increasing globalisation of the World Economy and the skill biased nature of technical change may have been at least as important. The use of aggregate data may also fail to reveal structural change. Our discussion of flows in the labour market based on individual behaviour does reveal some changes in the early 1990s. The timing of these changes, and the decline in earnings inequality seen at the same time, may help us understand the causes of the rise in unemployment as well as lead us to conclusions about the cures for the problem.

The early stages of the Thatcher revolution involved the reduction of union powers, the removal or curtailment of employment protection and

the disbanding of the Wages Councils. These policies were designed to shift the economy from a corporatist to a more competitive market based structure on US lines. In order to push the economy in this direction there were also significant reductions in the elements of the social safety net, and especially in the generosity of unemployment benefits. This was particularly severe for single individuals who did not benefit from changes in housing allowances. The failure of these measures to transform the economy were made apparent in the Lawson boom of the late 1980s.

The failure of the 1980s can be contrasted to the successes of the 1990s. These may have so far been limited, but they are apparent. The UK labour market faced many problems in the early 1980s, but over regulation and over-unionisation may not have been the most important. The UK labour force lacked the skills and flexibility to deal with the problems it was facing. Government training programmes began to address some of these problems in the mid 1980s, and increases in participation in higher education in the 1990s have also begun to have an impact. The effects of these changes have been slow to come through, partly because the flow of successful trainees is small relative to the stock of workers, but also because some of the early 'training schemes' were no more than cosmetic. However, by the early 1990s increasing numbers of workers had skills and experience that made them employable. This increase in the effective supply of labour in the early 1990s was a major factor behind slow wage growth in the recovery of the early 1990s. The balanced nature of the recovery of the 1990s, in terms of the regional and industrial structure of demand, has also helped the economy achieve lower levels of unemployment, as inflationary bottlenecks have not developed in the some regions and industries and not others as they did in the late 1980s. The combination of improved workforce skills, increased participation in higher education and the more balanced nature of the recovery may also have contributed significantly to the decline in earnings inequality we have seen in the UK in the 1990s.

The importance of training and skills to the proper functioning of the labour market cannot be overemphasised. The last twenty years have seen a widening of the distribution of earnings in the US, and more recently in the UK. This has at least in part been driven by changes in technology and trade which have raised the demand for skilled labour relative to unskilled labour, and have also required greater flexibility on the part of the workforce. The structure of skills, work patterns and

education in the US and the UK seem to have been particularly unsuited to these changes. This is particularly clear when we make comparisons with Germany, where there has been no rise in inequality. Research at the National Institute summarised in the DfEE Report on the US suggests that a combination of much higher levels of vocational training and longer attachments to firms have been important in helping Germany deal with recent developments.

Sustainable unemployment in the UK is currently well above acceptable levels, and it is important to understand how we might reduce it to levels seen in the 1960s. This cannot be done by raising the level of demand in the economy, as we were beginning to see at the end of 1996. Reform of incentives to work is clearly part of such a package, but providing people with the skills to work effectively is in the long run at least as important. The provision of greater skills to a wide section of the workforce is important if we are to achieve acceptable levels of unemployment without unacceptable increase in income inequality, as have been seen in the US. Reducing benefits induces people to take work at lower wages. Providing skills allows them to work at reasonable levels of income.

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Appendix A

Transition rates for the population 25+

t=1992		E_{t-1}	U_{t-1}	G_{t-1}	IN_{t-1}
	E_t	0.920	0.262	0.179	0.081
	U_t	0.037	0.519	0.198	0.034
	G_t	0.004	0.038	0.437	0.006
	IN_t	0.040	0.182	0.186	0.879

t=1993		E_{t-1}	U_{t-1}	G_{t-1}	IN_{t-1}
	E_t	0.937	0.267	0.162	0.100
	U_t	0.033	0.522	0.176	0.048
	G_t	0.003	0.038	0.508	0.006
	IN_t	0.028	0.173	0.155	0.846

t=1994		E_{t-1}	U_{t-1}	G_{t-1}	IN_{t-1}
	E_t	0.944	0.284	0.195	0.105
	U_t	0.027	0.510	0.105	0.047
	G_t	0.002	0.035	0.535	0.005
	IN_t	0.027	0.170	0.165	0.842

t=1995		E_{t-1}	U_{t-1}	G_{t-1}	IN_{t-1}
	E_t	0.950	0.309	0.189	0.110
	U_t	0.022	0.489	0.159	0.045
	G_t	0.002	0.030	0.489	0.005
	IN_t	0.026	0.173	0.163	0.839

t=1996		E_{t-1}	U_{t-1}	G_{t-1}	IN_{t-1}
	E_t	0.950	0.310	0.173	0.107
	U_t	0.022	0.483	0.147	0.047
	G_t	0.002	0.028	0.566	0.005
	IN_t	0.026	0.179	0.114	0.841

t=1997		E_{t-1}	U_{t-1}	G_{t-1}	IN_{t-1}
	E_t	0.954	0.347	0.182	0.114
	U_t	0.019	0.451	0.160	0.041
	G_t	0.002	0.026	0.490	0.005
	IN_t	0.026	0.177	0.168	0.840

E: *employed*
U: *unemployed*
G: *participating in a government employment or training programme*
IN: *inactive (excluding the retired)*

Appendix B

Eigenvalues and Eigenvectors

	Eigenvalues	Eigenvectors (rows)			
1992	1.000	0.825	0.102	0.017	0.450
	0.840	-0.564	-0.004	0.003	0.565
	0.535	-0.265	0.380	0.121	-0.235
	0.380	0.091	-0.352	0.223	0.038
1993	1.000	-0.970	-0.103	-0.018	-0.308
	0.827	-0.906	0.044	0.014	0.848
	0.560	0.529	-0.723	-0.421	0.615
	0.425	0.381	-1.115	0.476	0.258
1994	1.000	-0.975	-0.083	-0.014	-0.270
	0.827	0.836	-0.049	-0.013	-0.774
	0.556	-0.233	0.225	0.284	-0.276
	0.448	0.093	-0.251	0.095	0.062
1995	1.000	-3.356	-0.227	-0.035	-0.822
	0.826	-1.975	0.131	0.027	1.817
	0.530	-0.767	0.973	0.577	-0.782
	0.412	0.510	-1.284	0.462	0.311
1996	1.000	3.259	0.226	0.037	0.817
	0.828	-2.005	0.133	0.032	1.840
	0.583	0.790	-0.728	-0.871	0.809
	0.429	0.551	-1.194	0.222	0.421
1997	1.000	-3.642	-0.196	-0.031	-0.831
	0.826	-1.919	0.107	0.027	1.785
	0.517	0.768	-0.877	-0.645	0.754
	0.392	-0.654	1.351	-0.320	-0.376