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Age structure and the UK unemployment rate⁽¹⁾

By Richard Barwell, formerly of the Bank's Structural Economic Analysis Division.⁽²⁾

The proportion of youths in the labour force has fallen dramatically in the past 15 years, following the collapse in the birth rate in the 1970s (the 'baby bust'). Youths always have higher unemployment rates than adults, so this change in the composition of the labour force may have contributed to a fall in the aggregate unemployment rate. Based on data from the Labour Force Survey, it appears that about 0.55 percentage points of the 5.65 percentage point fall in the UK unemployment rate between 1984 and 1998 can be accounted for by changes in the age structure of the labour force.

Introduction

Most models of the labour market assume a short-run trade-off between unemployment and inflation; this assumption is at the heart of the Phillips curve relationship and the expectations-augmented models that followed it. So recent developments in the labour market have puzzled economists: in August 1999, for example, the number of people out of work and claiming benefit fell to a 19-year low and yet the RPIX inflation rate was at its lowest level for more than five years.

Part of the explanation of this puzzle may be that the natural or equilibrium rate of unemployment has fallen, enabling the actual unemployment rate to fall substantially without generating a pick-up in inflation. Explanations for the fall in the natural rate have tended to focus on supply-side factors, such as the decline in union bargaining power, reduced generosity of unemployment benefits and increased deregulation of the labour market. This paper examines another supply-side explanation, which has received less attention in the United Kingdom: that the natural rate has fallen partly because of changes in the composition of the labour force. Youths⁽³⁾ tend to have higher unemployment rates than adults, and presumably have higher natural unemployment rates as well. The proportion of youths in the labour force almost halved over the past decade, so we would expect the aggregate unemployment rate and the natural rate to have fallen as a result.

Most of the existing literature investigating the impact of demographic change on the unemployment rate has looked at the US labour market. Katz and Krueger (1999) find that changing age structure accounts for about half of the fall in US unemployment between 1979 and 1998; Shimer (1998) finds that the effect is even larger, at about 70%. This paper provides a comparable estimate of the fall in UK

unemployment that can be accounted for by the decline in the youth share of the labour force.

The first section presents two key stylised facts, which together suggest that demographic change could play a significant role in explaining recent developments in the UK labour market. First, that the youth share of the labour force has fallen dramatically over the last decade, and second, that youths always have higher unemployment rates than adults; the latter is analysed in the second section. The third section explains the 'shift-share' methodology developed in the literature, and uses it to provide a range of estimates of the impact of demographic change in the labour force on the unemployment rate. The fourth section discusses two alternative approaches that control for changes in the labour force participation rates of each age group. The final section uses current projections of the future size and composition of the labour force to assess the implications for the unemployment rate in the near future.

Stylised facts

Demographic change

The United Kingdom, like most of the developed world, has experienced a sustained period of significant demographic change in the postwar period. The crude birth rate⁽⁴⁾ increased rapidly in the late 1950s and early 1960s, from 15 in 1955 to 18.5 in 1964, then collapsed to a low of 11.5 in 1977. It has since stabilised (see Chart 1). These changes were echoed 16 years later in the size of the youth cohort entering the labour market. Chart 2 illustrates the dramatic fall in the youth share of the labour force between the late 1970s and the mid-1990s: the proportion of 16–19 year olds in the labour force peaked at 9.9% in 1981, but had fallen to 5.8% by 1994.

(1) Based on a forthcoming *Bank of England Working Paper*, 'Age structure and the UK unemployment rate'.

(2) This work was completed while the author was working at the Bank.

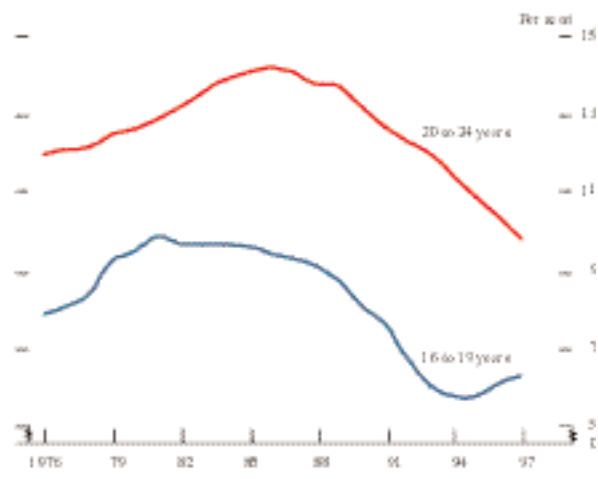
(3) 'Youths' here refers to the 16–24 age group.

(4) The crude birth rate is measured as the total number of births each year multiplied by a thousand and divided by the total population.

Chart 1
Crude birth rate



Chart 2
The youth share of the labour force



Although the large fall in the birth rate in the 1970s will have reduced the number of youths of working age, a number of other factors may have affected the youth share of the labour force, such as increased participation in the tertiary education system: the number of youths attending further and higher education colleges more than doubled between 1980 and 1995, which reduced the proportion of youths either employed or actively searching for work.

This reduction in the youth share of the labour force can be highlighted by changes in the youth activity rate. Between 1994 and 1998, the activity rate of the 16–17 age group fell by more than 4 percentage points, and that of the 18–24 age group fell by 7 percentage points. This had a significant impact on the number of youths in the labour force—if activity rates had remained at their 1984 levels, there would have been approximately 400,000 more youths in the labour force in 1998. Almost a quarter of the total fall in the number of youths in the labour force over the period was purely a result of changes in the youth activity rate, rather than of demographic pressures.

Changes in youth activity rates will not necessarily have affected the composition of the labour force to the same extent as they have the number of youths in the labour force. For men at least, activity rates have fallen for all age groups since the mid-1970s,⁽¹⁾ and so the size of the labour force may have fallen at a similar rate to the proportion of youths entering it. Changes in participation rates for specific age groups will matter only to the extent that they diverge from those of other age groups.

The youth unemployment gap

The unemployment rate is by identity equal to the product of the *inflow rate* into unemployment and the average *duration* of unemployment. So if U is the stock of unemployment, S is the inflow into unemployment and N is the size of the labour force then:

$$\frac{U}{N} = \frac{S}{N} \times \frac{U}{S} \quad (1)$$

In steady state, the number of people entering unemployment must equal the number leaving it. Letting H denote the total outflow from unemployment we get:

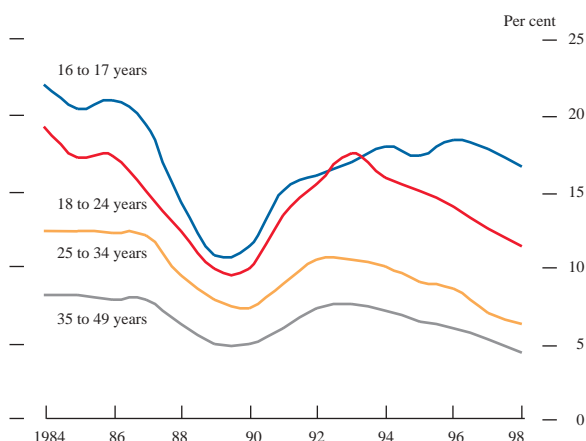
$$\frac{U}{N} = \frac{S}{N} \times \frac{U}{H} \quad (2)$$

The final term of (2) is the reciprocal of the outflow rate, so the steady-state unemployment rate can be expressed as the inflow rate into unemployment divided by the outflow rate from it:

$$\frac{U}{N} = \frac{S/N}{H/U} \quad (3)$$

Youths as a group always have higher unemployment rates than adults (see Chart 3). The UK data show that this is because younger workers have a higher propensity to become unemployed, ie their inflow rate into unemployment

Chart 3
Unemployment by age group



(1) Activity rates have risen for women. See Gregg and Wadsworth (1999).

is relatively higher. Once unemployed, however, their outflow rates from unemployment appear, if anything, to be marginally higher than those of adults; so, at any given time, a far smaller proportion of unemployed youths have been unemployed for an extended period. Although large numbers of young people flow into unemployment each period, relatively few end up becoming long-term unemployed.

Chart 3 shows that, relative to all other age groups, youths have had increasingly higher unemployment rates over the period. When the labour market began to recover in the mid-1990s, the unemployment rate of the youngest members of the labour force was the slowest to react—between 1993 and 1996 the unemployment rate of 16–17 year olds actually increased, while the rates of all other age groups fell. By 1998, while the unemployment rate of most other age groups had fallen by about a third, the unemployment rate of 16–17 year olds was still at its 1993 level. This may be because of increased participation in post-compulsory education—if, as seems likely, those members of each cohort with the best employment prospects enter further and higher education, then over time the average employability of the youths who join the labour force aged 16 will fall.

So our two stylised facts are:

- the proportion of youths in the labour force has changed dramatically over the past 20 years; and
- younger workers always have higher rates of unemployment than older workers because they have higher inflow rates into unemployment.

Given the orders of magnitude of the relevant variables, demographic change in the labour force clearly could have been large enough to have a material effect on aggregate unemployment.

The youth unemployment rate differential

Turnover in the labour market appears to be greatest for younger workers. Gregg and Wadsworth (1995) estimate that more than half of all the job changes during the course of a working lifetime occur before the age of 30, and a quarter before the age of 20. It appears that these high job separation rates can be explained either by discrimination against youths when firms are forced to lay off staff, or by the greater propensity of young workers to quit their jobs.

Firms' lay-off policies

Firms are periodically forced to lay off some of their employees, both in response to transitory and permanent shifts in demand, and as a result of periodic restructuring of the workplace to increase efficiency or profitability. If firms disproportionately concentrate lay-offs among their youngest

employees, this might help to explain the higher youth inflows into unemployment. There are two main reasons why lay-offs may be concentrated among younger workers. First, that firms are constrained—by prior agreement to ‘last in, first out’ (LIFO) rules, which disproportionately target younger workers—in who will be laid off; and second, that firms choose to lay off their youngest employees.

Negotiated LIFO rules

In their survey of ‘Pay and Employment Determination in Britain’, Oswald and Turnbull (1985) find that LIFO is the most widely used method for choosing who will be made compulsorily redundant in a slump. The LIFO rule⁽¹⁾ discriminates against the most recent entrants to the workforce when the firm is forced to lay off staff. Youths are, almost by definition, recent entrants to any firm. Of the 350 establishments surveyed by Oswald and Turnbull, 64% used LIFO as their criterion to decide enforced redundancies. Although the recent decline in the coverage of trade union bargaining may have reduced the use of LIFO rules in deciding who is laid off, it is likely to remain important wherever unions have retained significant bargaining strength.

Firms choosing to lay off younger workers

Firms may choose to lay off their youngest employees in the face of a negative demand shock. Older workers will have acquired valuable workplace-relevant human capital during their time in the labour market. These skills will be costly for the firm to replace in terms of the financial cost of hiring and training replacements, and also because it will take time for a recent entrant to become familiar with the workplace. Also, if the firm chooses to lay off skilled incumbents it may be difficult to replace them when demand recovers. Conversely, young workers have little general or firm-specific workplace human capital and will still be in plentiful supply when demand recovers. So firms may choose to retain the skilled core members of its workforce and to concentrate lay-offs where possible among the least-skilled recent entrants.

The incentive to lay off younger less-skilled workers may be partly offset by the fact that they will almost certainly be paid substantially less than older members of the workforce, so the simplest way to cut labour costs significantly would be to lay off the more expensive older workers. However, there are sunk costs in hiring and/or training staff to replace skilled employees, and firms may not be able to continue to operate effectively without their skilled core workers. So lay-offs might still be concentrated among the least skilled, despite the fact that they are cheaper to employ. In the Oswald-Turnbull survey, 47% of firms reported deciding enforced redundancies according to which workers were ‘least skilled or competent’. Also, if firms believe that youths are more likely to quit than adults then they may delay training new employees, which will prolong the period

(1) LIFO is typically introduced at the behest of unions, because LIFO rules give increased job security to the majority of employees.

for which young entrants to the firm will be viewed as low-skill workers (see Farber (1994)).

Youths' higher propensity to quit

Young people quit their jobs more frequently. There are two main reasons why they may do so: they may be employed in types of jobs that encourage them to quit more often, or they may behave differently from adults in the labour market.

Low-wage/secondary sector jobs

The probability that an individual will quit a job is generally taken to be inversely proportional to the wage offered, so low-wage industries are generally also high-turnover industries. The labour market is often characterised as comprising two sectors: a primary sector of high-wage jobs, for which there are job queues and for which voluntary quits (into unemployment) are rare; and a secondary sector of low-skill jobs, characterised by low pay, poor working conditions and limited prospects for training or future wage growth.

Low pay is remarkably concentrated in a very small number of industries—half of all the low paid work in just six occupations (see Metcalf (1999a)). Younger workers are concentrated in the secondary sector (two fifths of those aged 18–20 and more than half of those aged 16–17 work in the retailing and hospitality industries, both of which are classic low-pay employers (see Metcalf (1999b)), so they will be more likely to quit their jobs than older workers. This might also explain their higher inflow rates into unemployment. So, on this explanation, it is not that youths necessarily have an intrinsically higher probability of quitting their jobs than adults, but simply that disproportionate numbers of them work in the high-turnover secondary sector.

Why are youths more likely to be employed in the secondary sector? If youths have lower reservation wages,⁽¹⁾ they will be willing to accept low-wage jobs that adults will reject; and their reservation wages may be lower either because they have only limited access to government benefit when unemployed,⁽²⁾ or because their wages may be supplemented by contributions from their parents.

Adult workers may also be at a distinct advantage when applying for vacancies in the primary sector—they will be more productive (having acquired work-related human capital) and can provide references from previous employers to signal their ability and work ethic. Younger workers, with limited work experience and a shorter employment track record, will be at a distinct disadvantage to adults with otherwise identical observable productivity characteristics. So young workers are more likely to be forced initially to accept vacancies in the secondary sector.

'Job shopping'

An individual may be unable to assess how productive, and hence how well paid, he will be in a particular job until he accepts it. So individuals may sample a number of jobs, many of which they will quit when the match is revealed as unproductive—a process known as 'job shopping'. Job shopping is, in effect, the mechanism by which a new entrant to the labour force progresses towards a more permanent job. It may be that, because of their inexperience in the labour market, youths are more reliant on sampling jobs in order to discover their productivity; adults, on the other hand, may be better able to assess a job vacancy on inspection. So youths may accept—and then rapidly quit—jobs that adults would not have accepted in the first place.

Generational crowding and the youth unemployment rate

It is possible that the youth unemployment rate itself might be sensitive to the proportion of youths in the labour force. The empirical evidence (see Freeman and Bloom (1986)) suggests that the unemployment rate of a group, and in particular of youths, may be positively related to its share of the labour force. A number of factors will affect the size of these 'generational crowding' effects: the existence, level and coverage of any youth minimum wage legislation; the degree of substitutability and/or complementarity with other groups in the labour force; and the elasticity of demand for youth labour. So the shift in the composition of the labour force away from the young may have led to a fall in the youth unemployment rate, irrespective of any cyclical effects. However, as long as youth unemployment rates remain above those of adults, such shifts will still reduce the aggregate unemployment rate.

The quantitative importance of demographic change

The aim of this section is to quantify the importance for measured unemployment of the relatively higher youth unemployment rate and the significant change in the demographic composition of the labour force. To do so, changes in the aggregate unemployment rate over time are decomposed into two parts: that accounted for by changes in the unemployment rates of the separate age groups in labour force; and that accounted for by changes in the composition of the labour force itself. This 'shift-share' approach has its origins in the work of Perry (1970), but can also be found in Summers (1986), Shimer (1998), Katz and Krueger (1999) and Horn and Heap (1999), among others.

Accounting for changes in the aggregate unemployment rate

The aggregate unemployment rate at any time can be defined as the weighted average of the unemployment rates of all the separate age groups in the labour force, where the weights are simply the respective group's share of the labour

(1) A worker's reservation wage is the minimum he will accept to compensate him for moving into employment.

(2) Those aged 18–24 receive £40.70 Jobseeker's Allowance per week, while those aged 25 and above receive £51.40, under both the contribution-based and income-based schemes (Benefits Agency (1999)).

force. So a fall in aggregate unemployment will originate either from a change in the composition of the labour force towards groups with lower unemployment rates, or from a fall in the unemployment rates of some or all groups, or from some combination of the two.⁽¹⁾

Following the terminology used by Katz and Krueger (1999), we define the age-constant unemployment rate as the weighted average of the age-specific unemployment rates, where the weights are the shares of each group in the labour force in a base year. It captures what would have happened to aggregate unemployment, given the observed changes in group unemployment rates, if there had been no age-related demographic change, ie holding the age structure in the base year fixed.

Katz and Krueger use the difference between the actual aggregate unemployment rate and this age-constant unemployment rate—the age adjustment to the unemployment rate (AAU)—to measure the impact of demographic change. This captures that part of the change in aggregate unemployment that cannot be explained by shifts in the group-specific unemployment rates alone, and must therefore be caused by shifts in the composition of the labour force.

The other main approach is to measure what would have happened to the unemployment rate if all the group-specific unemployment rates had remained constant and only the composition of the labour force had changed. This is the age-driven unemployment rate, ie the rate driven purely by demographic change. The rate depends (by construction) on the levels of unemployment in the base year, and so does not measure the unemployment ‘caused’ by demographic factors. But we can interpret the difference between the age-driven rate in a given year and unemployment in the base year as the implied change in the aggregate unemployment rate due to demographic pressures—the age-driven change in the unemployment rate (ADCU).

Shimer also uses a chain-weighted measure (CWM) to identify the change in unemployment attributable to demographic change between any two years. The CWM is not as sensitive to the choice of base year because of the implicit averaging involved in its calculation (see Shimer (1998)).

Empirical evidence

Dividing the labour force into youths (aged less than 25) and adults, using data for 1984–98 from the Labour Force Survey, Chart 4 shows that the age-constant unemployment rate tracks the actual unemployment rate quite closely for most of the period, and the two series are virtually indistinguishable up until 1989. Thereafter, however, the

effect of the changing composition of the labour force is not captured by the age-constant rate and so the actual unemployment rate falls further than the age-constant rate. The path of the age-driven unemployment rate reflects this decline in the proportion of the young in the labour force and also falls over the period. However, because it is based on 1984 unemployment rates, it is unaffected by the large fall in all the group-specific unemployment rates as the economy recovered from the severe slump in the early 1980s.

Chart 4
Time path of actual, age-driven and age-constant unemployment

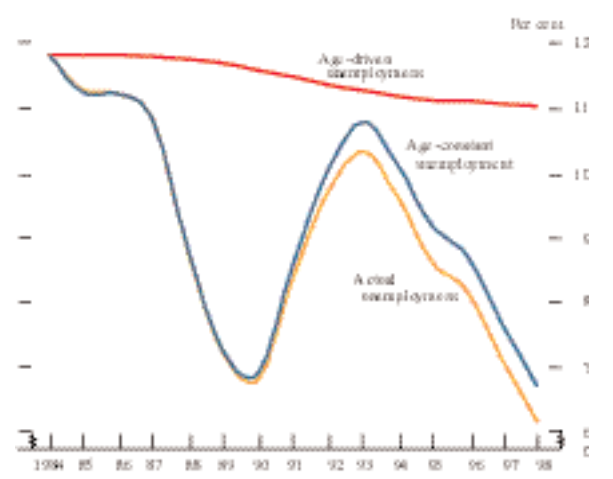


Table A summarises the changes in the different unemployment series. It appears that changes in the age structure of the labour force can account for 0.50 to 0.77 percentage points, or 9%–14%, of the fall in unemployment between 1984 and 1998.⁽²⁾

Table A
Estimates of impact on unemployment rate of demographic changes

Index of demographic pressure	Change (percentage points)	Percentage of change in unemployment rate explained
AAU	-0.55	10
ADU	-0.77	14
CWM	-0.50	9

Notes:
AAU = age adjustment to the unemployment rate.
ADU = age-driven unemployment rate.
CWM = chain-weighted measure.
See above for definitions.

Changing the base year

The results above use the unemployment rate and labour force composition in 1984 as the base for calculating the age-constant and age-driven unemployment rates. By repeating the analysis using each year in the sample in turn as the base, it is possible to test whether the results are qualitatively or quantitatively sensitive to the choice of base

(1) The forthcoming *Working Paper* contains a full mathematical exposition.

(2) These results may be sensitive to the way the labour force has been divided. But repeating this analysis by sub-dividing the labour force further into five separate age groups (16–17, 18–24, 25–34, 35–49 and 50+) gives very similar results: the impact of demographic change is very slightly less than the results shown above. See the forthcoming *Working Paper* for a fuller discussion.

year. The calculations of the age-constant and age-driven unemployment rates are now partly retrospective, so the definitions of the age adjustment to the unemployment rate and the age-driven change in the unemployment rate must be amended accordingly. The age adjustment to unemployment, given age-constant unemployment calculated using the base year, is now defined as the difference between the change in the unemployment rate and the change in the age-constant unemployment rate over the period.

The age-driven change in the unemployment rate is now defined as the difference between what the unemployment rate would have been in 1984 and in 1998, had group-specific unemployment rates remained at their values in the base year. The chain-weighted measure is of course unaffected, as it is based on the actual composition of the labour force and group unemployment rates in each year.

The results show that the choice of base year has a significant effect on the estimate of the impact of demographics on the unemployment rate. This is not surprising, as each base represents a different set of values for the composition of the labour force and for group unemployment rates.⁽¹⁾ But the mean estimates of the change in actual unemployment explained by each of the measures across all available base years (1984 to 1998) range from 0.49 to 0.65 percentage points, as shown in Table B, which is broadly in line with the estimates in Table A.

Table B
Mean estimates of impact on unemployment rate of demographic changes

Index of demographic pressure	Change (percentage points)	Percentage of change in unemployment rate explained
AAU	-0.65	11.5
ADU	-0.54	9.6
CWM	-0.49	8.6

See notes to Table A.

Generational crowding

The results above reflect only the direct compositional effect of demographic change, but do not capture interactions between group size and group unemployment rate. If, for example, the increase in the youth unemployment rate in the late 1970s and early 1980s was partly due to the rapid expansion of the ‘baby boom’ cohort, then the reverse would be seen as the proportion of young people in the labour force subsequently declined: both the youth share of the labour force and the youth unemployment rate would have fallen.

Shimer developed a useful measure of generational crowding effects, which in effect measures the correlation between age-specific labour shares and unemployment rates. If the measure is positive, then a group whose share of the labour force increases (decreases) will experience an

increase (decrease) in its relative unemployment rate—supporting the notion of generational crowding. Conversely, if the measure is negative, then those groups whose share of the labour force increases would enjoy a relative fall in their unemployment rates.

Taking the sample as a whole and dividing the labour force into youths and adults, there appears to be clear evidence of generational crowding: when the youth share of the labour force declined, the youth unemployment rate also fell relative to that of other groups in the labour force. This result is not robust, however; taking any year between 1987 and 1991 as the starting-point, the evidence is of *perverse* generational crowding effects, with youths experiencing increasingly higher unemployment rates as their share of the labour force fell.

The youth share of the labour force fell steadily over the entire period, so the direction of change of the youth/adult unemployment differential is crucial to the sign of Shimer’s crowding measure. The differential increased after 1989, despite the falling youth share of the labour force, which is why the perverse generational crowding effects are seen. A neutral assumption, on the available evidence, is probably that the group-specific unemployment rates have been independent of the composition of the labour force, and that the results discussed earlier remain appropriate measures of the effect of demographic change on unemployment.

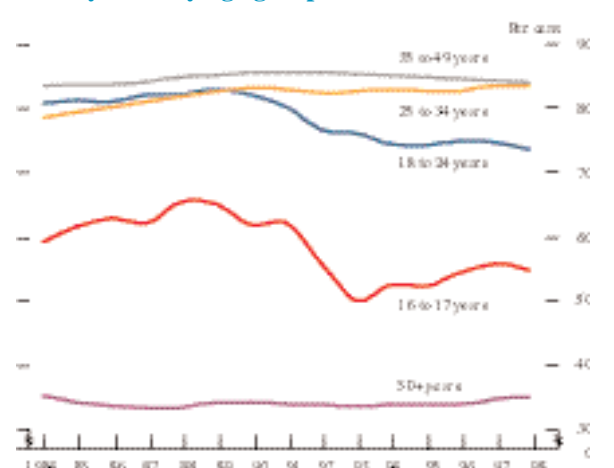
Controlling for changes in activity rates

The previous section provided estimates of how much of the change in the aggregate unemployment rate can be accounted for by changes in the composition of the labour force. However, as discussed in the first section, changes in the composition of the labour force are not driven only by demographic forces, but also by changes in activity rates of different age groups. As Chart 5 illustrates, the most striking change in activity rate occurred among the young—between 1984 and 1998, the activity rate of 16 to 24 year-olds fell by more than 6½ percentage points—which was almost certainly due to increased participation in post-compulsory education. However, changes in activity have not been confined to this age group—the participation rate of the 25–34 age group increased by about 5% between 1998 and 1984. Changes of this size may affect the size and composition of the labour force and hence the unemployment rate. We need to control for these changes in labour force participation by age group to measure accurately how much of the total change in the unemployment rate can be explained purely by demographic change.

The shift-share methodology outlined above can be modified in one of two ways to isolate the effects of demographic change. The first method essentially holds activity rates constant and calculates the hypothetical impact on the unemployment rate of changes in the composition of

(1) For a fuller discussion of the effect of changing the base year, see the forthcoming *Working Paper*.

Chart 5
Activity rates by age group



the labour force consistent with changes in the composition of the underlying population, given the observed behaviour of the group-specific unemployment rates. The second method focuses instead on how changes in the composition of the working-age population affect the fraction of the population who are unemployed.⁽¹⁾

Table C shows that once we control for changes in the activity rates of each group over the period, demographic change explains a smaller percentage point fall in the aggregate unemployment rate than estimated earlier. This is because this analysis excludes the effect of greater participation in post-compulsory education, which would otherwise have reduced the unemployment rate. Furthermore, increased activity rates for the 25–34 age group, *ceteris paribus*, increased the size of the total labour force, which exacerbated the observed fall in the youth share of the labour force and so exaggerated the earlier estimates of the impact of demographic change on the unemployment rate. However, shifts in the composition of the labour force driven purely by demographic change still explain about a 0.45 percentage point fall in the unemployment rate over the period, averaging over the three measures.

Table C
Impact of demographic change on the unemployment rate, controlling for changes in activity rates by age group

Index of demographic pressure	Change (percentage points)	Percentage of change in unemployment rate explained
AAU	-0.52	9.4
ADU	-0.43	7.8
CWM	-0.40	7.2

See notes to Table A.

The impact of demographic change on the unemployed

An alternative estimate of the impact of demographic change on the unemployed can be obtained by repeating our

shift-share analysis using working-age population shares and the ratio of each age group who are unemployed. The advantage of this approach is that it abstracts from all changes in labour force participation by focusing on changes in the composition of the working-age population, which is affected solely by demographic forces; the drawback is that it does not estimate the impact of demographic change on the unemployment rate itself.

Table D presents the results of this alternative shift-share decomposition, as before using each year in turn as a base for our calculations.

Table D
Impact of demographic change on the unemployed

Index of demographic pressure	Change (percentage points)	Percentage of change in unemployment rate explained
AAU	-0.38	8.5
ADU	-0.31	7.0
CWM	-0.28	6.3

See notes to Table A.

These results imply a smaller role for demographic change in explaining the absolute and proportional fall in the fraction of individuals who are unemployed compared with the other two approaches. This is largely due to the fact that the gap between the proportion of the youth and adult populations who are unemployed is significantly smaller than the differential between the youth and adult unemployment rates. So shifts in the composition of the working-age population would be expected to have a less important role in explaining changes in the fraction of the whole population who are unemployed.

Both of these alternative approaches show that, once we control for changes in labour force participation rates by age, shifts in the composition of the labour force explain less of the change in the aggregate unemployment rate over the period. However, demographic change remains the predominant cause of changes in the composition of the labour force, and hence of the estimated change in the unemployment rate from this source.

The effect of demography on future unemployment

Finally, what are the likely implications of demographic change on the future unemployment rate? Given reasonable assumptions about the pattern of fertility and mortality rates and the size and direction of cross-border migration, we can project the resident population into the future. To estimate the composition and size of the labour force, we also need to forecast the percentage of each of the separate groups in the labour force who will be either employed or actively searching for work.⁽²⁾

(1) For a fuller discussion of these methods, see the forthcoming *Working Paper*.

(2) These projections of the group-specific activity rates typically rely on four separate sets of explanatory variables: the level or change in the level, of the unemployment rate; the number of dependent children aged under 5 per woman; lagged activity rates; and time trends to capture other structural factors (see Armitage and Scott (1998), page 291).

We can identify three broad trends in the labour force projections for the next decade:⁽¹⁾

- The youth share of the labour force will begin to recover from the baby bust and will increase slightly over the period.
- The number of people aged between 25 and 34 will decline sharply, as the baby bust generation reaches maturity.
- The relative share of the older section of the labour force (aged 35 or more) will increase, as the bulge in fertility rates in the early 1960s passes through the age distribution.

Given these projections, it is possible to make a tentative forecast of the implied change in the aggregate unemployment rate due to demographic pressures. By dividing the labour force into the three broad groups described above and taking 1998 as the base year, we can calculate the age-driven change in the unemployment rate based on the observed unemployment rates of each of these groups in our base year.

The impact of these demographic changes appears to be relatively weak throughout the period—demographic pressures will be responsible for a fall of about 0.035 percentage points, at most, in the aggregate unemployment rate. However, the potential for these benign demographic forces to reduce the unemployment rate has already been almost exhausted. The age-driven unemployment rate is projected to fall until 2001, and thereafter, following a short period of volatility, to remain at its 1998 level.⁽²⁾ But, on the basis of these results, it is difficult to draw any conclusion other than that, however important demographic change may have been in the evolution of the unemployment rate in the past 20 years, there is little evidence that it will have much effect for the foreseeable future.

As emphasised above, shifts in the composition of the labour force can arise not only through demographic change but also through changes in the proportion of each age group that is economically active.⁽³⁾ Controlling for any projected

changes in the age-specific activity rates over the period, however, has a negligible effect on our estimates of the reduction in the unemployment rate implied by future shifts in the composition of the labour force. Finally, the impact of demographic change on the proportion of the working-age population that is unemployed is quantitatively similar.

Conclusions

The proportion of youths in the UK labour force has almost halved over the last 15 years. As youths have a higher unemployment rate than adults and the aggregate unemployment rate is simply the weighted average of the age-specific unemployment rates, a shift of this kind in the composition of the labour force should have been reflected in a fall in the aggregate unemployment rate.

Quantitatively, demographic pressures do indeed appear to explain part of the change in actual unemployment.

Although this change is sensitive to the precise measure used, particularly the assumption made about the base year, it appears that about 0.55 percentage points,⁽⁴⁾ or 10%, of the fall in the unemployment rate between 1984 and 1998 can be accounted for by changes in the composition of the labour force. There is no robust evidence, however, that youths became less likely to become unemployed, through generational crowding effects, as their share of the labour force declined.

However, demographic pressures were not the only forces that affected the composition of the labour force over the period; changes in the participation rates of different age groups will also affect the unemployment rate. Controlling for these, demographic change explains less of the change in the unemployment rate over the period. However, it appears that the shift in the composition of the population caused by the baby boom and bust still explains about 0.45 percentage points⁽⁵⁾ of the fall in the unemployment rate over the period.

Finally, on the basis of current projections, it appears that future shifts in the composition of the labour force will have little effect on the unemployment rate over the next decade.

(1) Based on projections of the composition of the labour force in Armitage and Scott, *op cit*.

(2) In the interim, any generational crowding effects from changes in the composition of the labour force might amplify these results.

(3) For example, it is estimated that irrespective of any increase in the number of youths in the population, approximately 150,000 more youths will be economically active in 2011 than in 1998.

(4) This is approximately equal to the average (over all base years) of the age-driven change in the unemployment rate, the age adjustment to the unemployment rate and the chain-weighted index, when the labour force is divided into only youths and adults (actual change = 0.56 percentage points).

(5) As before, this is equal to the average (over all base years) of the age-driven change in the unemployment rate, the age adjustment to the unemployment rate and the chain-weighted index, when the labour force is divided into only youths and adults.

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