

Understanding labour force participation in the United Kingdom

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Understanding the labour market requires an assessment of labour supply as well as labour demand. Labour supply is a significant component of the overall supply side of the economy which plays a role, alongside demand, in shaping inflationary pressure in the economy. How the economy's supply capacity has been affected by the recession has been raised as an important issue in recent *Inflation Reports*. How labour force participation evolves in the medium term is likely to depend on whether recent trends in participation continue and how those trends are affected by, among other things, the recession. This article presents a disaggregated view of labour force participation in order to assess the role of these influences.

Introduction

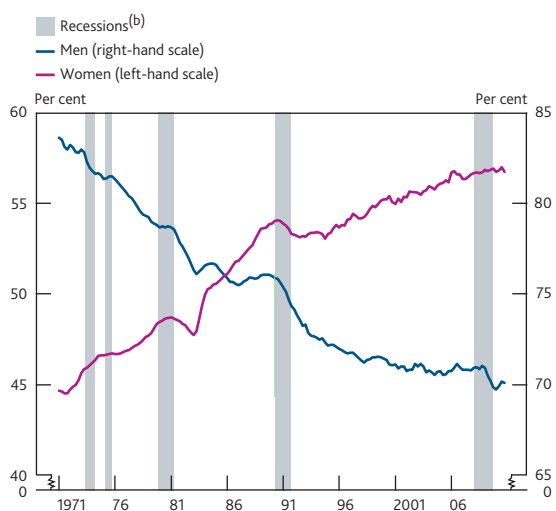
The decision of whether to participate or not in the labour market is a choice of whether to work or search for work on the one hand versus remaining out of the labour market on the other hand. The latter might involve studying, looking after the home or retirement.

The number of people who choose to participate in the labour market is important because it tells us about labour supply. Understanding the labour market requires an assessment of labour supply as well as labour demand. Labour supply is also an important part of the overall supply side of the economy which plays a role, alongside demand, in shaping inflationary pressures in the economy.

Put simply, participants are the employed and unemployed; everyone else is a 'non-participant'. **Chart 1** highlights the contrasting trends in participation rates among men and women over the past 40 years. In that period the participation rate of women has risen by over 10 percentage points while that of men has fallen by over 10 percentage points. These trends reflect quite profound changes in the UK labour market (and indeed in wider society), although those changes have been less marked in recent years.

Through the recent recession, the UK participation rate fell. That decline in participation was concentrated among men, but was still much smaller than in the early 1990s recession. Among women, the participation rate has held up, also rather unlike its pattern in and after some previous recessions (**Chart 1**).

Chart 1 Labour force participation rates^(a)



Source: ONS (including the Labour Force Survey).

- (a) Percentage of the 16+ population. Rolling three-month measures.
 (b) Recessions are defined as two consecutive quarters of falling output (at constant market prices) estimated using the latest data. The recessions are assumed to end once output began to rise.

How the participation rate evolves is likely to depend on whether some past trends in participation among different groups of the population continue. But it will also depend on how these trends are affected by a number of other factors, some of which are associated with the recession.

Whether a person decides to participate in the labour market or not is likely to depend on how the wage offers they receive compare to the wage they require to accept a work offer

(1) The authors would like to thank Srdan Tatomir for his help in producing this article.

(known as the 'reservation wage'). Participating in the labour market may also expand the range of work options available to the individual in the future, which may increase their future earnings.

This article describes a cohort-based approach to understanding participation decisions in the United Kingdom. That approach distinguishes between cohorts of the population born at different times and considers each cohort's participation decisions at different points in their life cycle. The first section describes some stylised facts on participation rates. The second section outlines how the cohort-based approach to understanding participation is constructed. The third section discusses the outlook for labour force participation and how it might be affected by a number of behavioural and policy changes.

Stylised facts on participation decisions

Participation decisions are best understood in a life-cycle context — the approach adopted in this article. That is because wage offers and/or reservation wages vary markedly at different ages. Those in turn, generate the strong life-cycle profile in participation rates shown in **Charts 2 and 3**.

Life-cycle effects

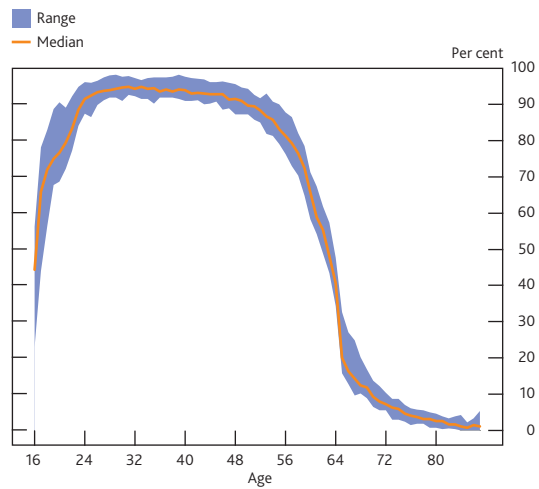
How do participation rates vary over the life cycle? Male participation rates peak in the mid-30s and remain high up to the early 50s, from which point they fall back quite markedly. Among women, there has tended to be a dip in participation at the traditional child-rearing ages from the mid-20s to mid-30s. Participation rates for women then peak around the mid-40s at just above 80%, a lower level than for men. Of course, the precise shape of these life-cycle profiles might be different for people born in the 1950s compared to those born in, say, the 1970s.

Some of the changes in participation rates over time reflect changes in participation decisions at a particular age. Those changes are reflected in the lilac swathes shown in **Charts 2 and 3**.

Chart 2 shows that over the past 25 years the variation in participation rates by age for men has been most marked for young (under 25) and older (65 and over) age groups. In general that variation has been less pronounced than among women for whom it has been especially notable at typical child-rearing ages (**Chart 3**).

Life-cycle profiles are particularly important if they are combined with anticipated changes to the age structure of the population — that will shift the proportions of the population at different points in the life-cycle profile. The changing age structure of the UK population is discussed later in this article.

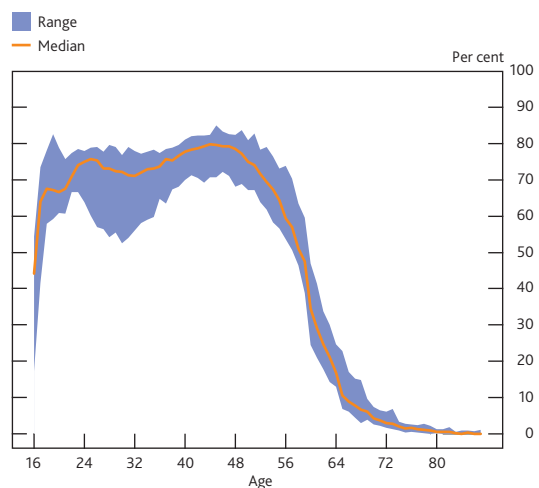
Chart 2 Participation rate over the life cycle — men^(a)



Sources: Labour Force Survey and Bank calculations.

(a) Participation rates at each age between 1984 and 2010. Based on data for the three months to June between 1992 and 2010 and the three months to May between 1984 and 1991. Data are non seasonally adjusted.

Chart 3 Participation rate over the life cycle — women^(a)



Sources: Labour Force Survey and Bank calculations.

(a) Participation rates at each age between 1984 and 2010. Based on data for the three months to June between 1992 and 2010 and the three months to May between 1984 and 1991. Data are non seasonally adjusted.

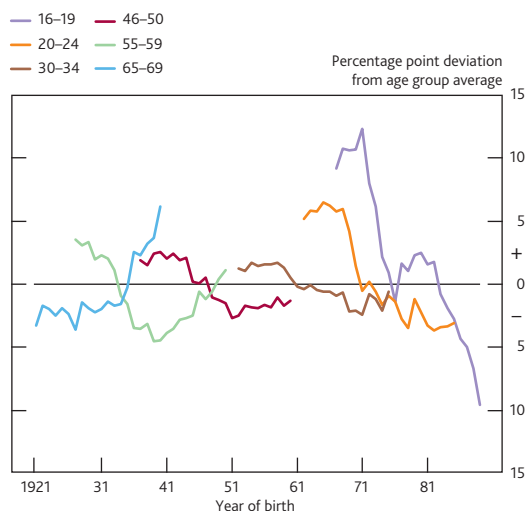
Cohort effects

A cohort can be defined by when a group of individuals was born. A cohort can be associated with different participation rates from average across their life cycle, and that is the 'cohort effect'. For instance, the participation rate of those born in the early 1950s may be influenced by a different set of social customs, incentives and constraints than someone born in the early 1970s, even when the two groups are at a similar age. The effects might reflect institutional and policy differences across cohorts and social mores, for instance.

These cohort effects are hinted at in **Charts 2 and 3** by the range of participation rates observed at a given age (the lilac swathe). That variation is particularly pronounced for women. How the experience of different cohorts has varied over time is

shown more clearly in **Charts 4** and **5**. Each line in **Charts 4** and **5** represents a different age group and shows how the participation rate of different cohorts varies at a particular age relative to the average over the whole period between 1984 and 2010.

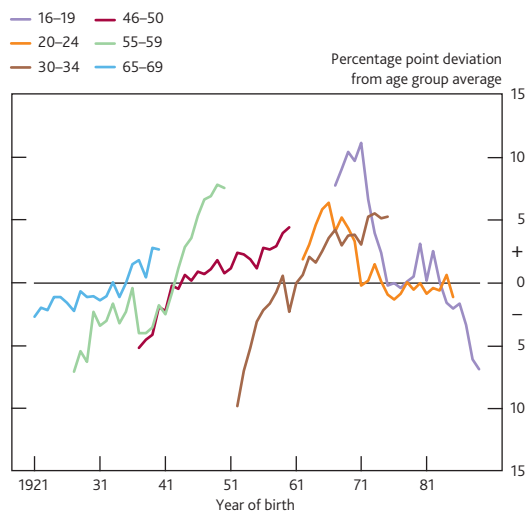
Chart 4 Male participation rates^(a)



Sources: Labour Force Survey and Bank calculations.

(a) Based on data for the three months to June between 1992 and 2010 and the three months to May between 1984 and 1991. Data are non seasonally adjusted. Only observations where a cohort is observed for all years within an age group are shown. For clarity not all age groups in the population are shown.

Chart 5 Female participation rates^(a)



Sources: Labour Force Survey and Bank calculations.

(a) Based on data for the three months to June between 1992 and 2010 and the three months to May between 1984 and 1991. Data are non seasonally adjusted. Only observations where a cohort is observed for all years within an age group are shown. For clarity not all age groups in the population are shown.

These cohort charts reveal a number of interesting observations. First, among the young (those aged less than 25 — shown towards the right-hand side of **Charts 4** and **5**) participation rates have fallen quite markedly. For those aged 16–19, participation rates have fallen by around 15 to 20 percentage points (lilac lines at the right of the charts).

That mainly reflects higher enrolment rates in further and higher education. Second, among women, participation rates have been increasing for successive cohorts from their late 20s to their late 30s (**Chart 5**). This could reflect easier and cheaper access to child care, as well as social mores encouraging female participation, including a quicker return to work after childbirth (eg Gregg *et al* (2007)). Housing market factors may also have played a role in some of these trends. The rise in house prices to earnings may have both reflected and reinforced a trend towards higher female labour participation. Third, at older ages (the lines shown towards the left-hand side of each chart), participation rates have been rising markedly — at least since the early 1990s recession among men and continually so since the early 1980s for women. That may be related to changes in the type of work people do, changes in pension provision and increased life expectancy, among other things.

Understanding participation: a cohort-based approach

From aggregate data on participation rates over time (**Chart 1**), it is not possible to identify trends in households' participation choices by different cohorts. Adopting a cohort-based approach to participation decisions is needed in order to uncover those trends. The outlook for the participation rate is likely to depend on how those disaggregated trends continue to evolve.

The aim of this approach is to understand and quantify the factors affecting the participation decisions for men and women at different ages, and born at different times. The cohort approach tracks each year of birth cohort as it ages during the period 1984 to 2009. Men and women are considered separately, with each cohort observed for up to 26 years of their life cycle. For example, this means one cohort tracks a representative man (and separately, a woman) born in 1950, aged 35 in 1984, then aged 36 in 1985 etc, until s/he is aged 60 in 2009. In this way, the analysis follows a 'representative' individual for the cohort as this representative person ages through time — even though no single individual is traced through time.

For this exercise the raw data are derived from 3 million individuals surveyed in successive Labour Force Surveys (LFS). Using successive years of the LFS, this approach can allow for age effects, cohort effects, a cyclical effect associated with lagged aggregate unemployment and several other effects. The approach follows that of Aaronson *et al* (2006) applied to US data and Balleer *et al* (2009) for euro-area economies.

The outlook for labour force participation

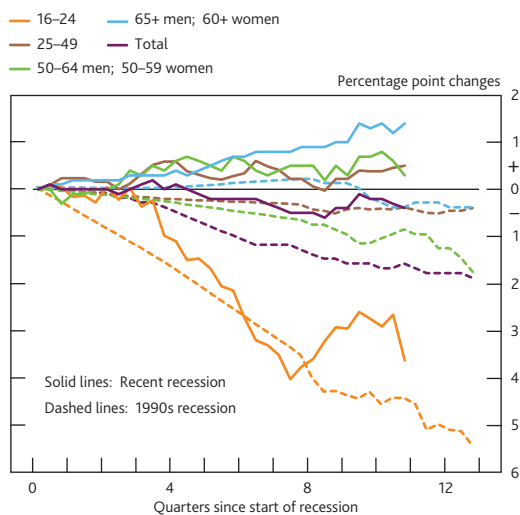
The analysis can be used to help shed light on a number of influences likely to shape the outlook for labour force participation in the United Kingdom. This discussion of the future outlook for participation is inevitably more uncertain than the discussion of past trends.

The business cycle

Past downturns have typically seen participation rates decline. This is sometimes termed a 'discouraged worker effect'. As well as the aggregate cyclical pattern of participation associated with a downturn, it is possible to consider which groups experience the strongest cyclical responses.

Chart 6 compares the profiles for the participation rate by age group through the recent recession (solid lines) and that of the early 1990s (dashed lines). It shows that the participation rates of the young tend to vary most through a recession. A striking feature of **Chart 6** is that the fall in the participation rate in and after the recent recession has, so far at least, been restricted to the young (aged under 25). Older-worker participation has risen modestly. That is in marked contrast to the experience of the early 1990s recession when participation rates among all those of working age declined.

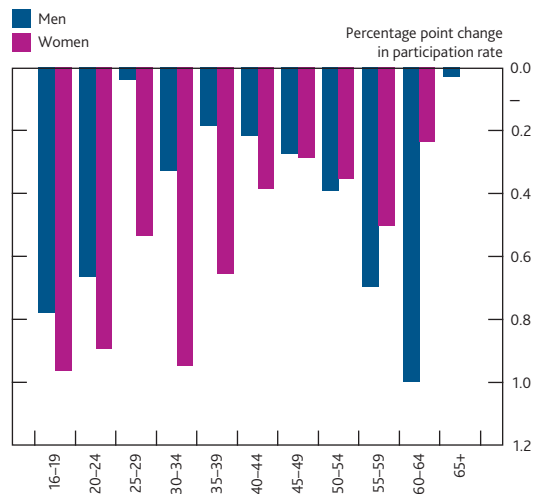
Chart 6 Changes in participation rates by age in recessions^{(a)(b)}



(a) Rolling three-month measures. Observations prior to the three months to May 1992 are based on non seasonally adjusted annual data for the three months to May in each year, rolling three-month data are linearly interpolated over this period.
 (b) Recessions are defined as in Chart 1. Solid lines show changes from 2008 Q1, dashed lines refer to changes from 1990 Q2.

One way of representing the various influences on participation rates (eg age and cohort effects, business-cycle effects) is through a regression model. Some results from that regression model, estimated on data between 1984 and 2009, are illustrated in **Chart 7**. Those results indicate how the cyclical response of participation varies across different age

Chart 7 Estimated response of participation rates by age to a 1 percentage point increase in aggregate unemployment^(a)



(a) Response to a 1 percentage point change in aggregate unemployment one year earlier. Responses are from a regression model estimated between 1984 and 2009. The model also includes a range of other explanatory variables including age, cohort effects, health problems, education, life expectancy, financial wealth and number of children.

groups on average over the past. These point estimates are uncertain, however.

The estimations suggest that, among men, more of the relatively young and relatively old respond to higher unemployment rates by withdrawing from the labour market. Among older men in particular, the early 1990s recession saw a pronounced fall in participation rates. For women, the response among the young to unemployment is also relatively strong. These groups are likely to find it easier to substitute alternative activities for work or job search, with the young tending to invest in human capital — for example deciding to be students — and the relatively old taking early retirement. A similar pattern was found by Aaronson *et al* (2006) for the United States.

The rise in unemployment since mid-2007 might be expected to push down on participation rates as work is more difficult to find. Offsetting this effect to a degree, some people may of course enter the labour force, for instance if their partner has lost his or her job — sometimes described as an 'added worker effect'. Since 2008, the aggregate participation rate has declined slightly, especially among men (**Chart 1**). That suggests that the discouraged worker effect has dominated, but to a lesser extent than estimates based on the average of the past would imply (**Chart 7**).

Certain institutional features that eased the transition of older workers from the labour market in and after the early 1990s recession seem unlikely to operate in the same way following the recent recession. For instance, the relatively generous early retirement provisions available from occupational pensions and the availability of disability benefits were

important in helping account for the fall in participation after the early 1990s recession (Blundell and Johnson (1997)). These features of the policy environment have changed since the early 1990s. Defined benefit occupational pensions are less widely available, and where schemes are available generous early retirement provisions may not be. That may alter the cyclical response of participation and make participation less sensitive to the cycle than in the early 1990s. That may help explain why, in **Chart 6**, the participation rates of the older age groups have tended to rise since the onset of the 2008/09 recession, unlike during the early 1990s.

Financial wealth

Economic theory suggests that a reduction in financial wealth raises labour supply (and participation rates). Among older workers, for instance, lower pension wealth implies lower annuity income and an incentive to delay retirement to raise that pension income. Among younger workers these are likely to be less affected since they have generally accumulated less wealth, and above the age of 25 participation rates are close to their peak, implying that there is less scope to increase participation rates. If asset prices are lower than had been expected for those close to retirement, this may cause them to defer their retirement and push up on participation rates.

Changes in the structure of pension provision might also affect incentives for early retirement. An increased incidence of defined contribution pensions makes more employees directly exposed to asset returns. Among those with defined benefit pensions the declines in asset returns may make the availability of early retirement packages more restrictive. These factors may help account for the ongoing rise in participation rates at older ages including through the recent recession.

Changes in the state pension age

The state pension age for women, previously 60, was raised in April 2010 and is scheduled to rise steadily until it is equalised with male state retirement age by 2018. And further rises in the state pension age for men and women have been proposed.

There is a sharp drop in participation rates at the state pension age, a fall that is more pronounced than at the surrounding ages. This is likely to partly reflect liquidity constraints. Since it is difficult to borrow against future pension wealth, some employees with low levels of wealth may need to work until they receive the state pension.

By observing how the participation rate varies by age at the previous state retirement age (60 for women and 65 for men) compared with how it changes at surrounding ages, it is possible to estimate the effect of changing the state pension age on participation rates. For instance, in the 2009 data the female participation rate falls by 13 percentage points on

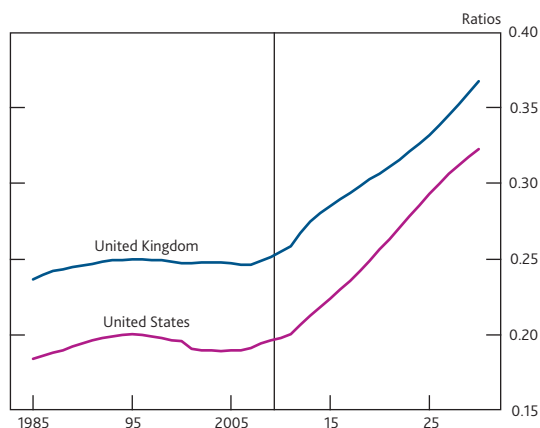
turning 60. However, the participation rate falls by 4 percentage points a year on average between the ages of 55 and 65 (excluding 60). That suggests that reaching state retirement age may reduce the female participation rate by around 9 percentage points. Raising that state pension age then translates into a higher participation rate as each cohort must wait to receive their state pension and a fraction of them delay their retirement as a result.

The age structure

In the past 25 years, changes to the age structure appear to have had a neutral influence on the aggregate participation rate. That may change over the next decade, as the 'demographic bulge' associated with the ageing baby-boomers (often used to refer to those born between 1946 and 1964) reach older ages where participation rates are lower.

Chart 8 shows that ONS projections imply that the proportion of the population aged above 65 is set to rise dramatically over the next ten years, after having been broadly stable since the 1980s. The dependency ratio (the population aged 65 and over divided by that aged 16 to 64) is expected to rise from one in four of the population in 2010 to around one in three of the population by 2020. The trend is expected to continue beyond 2020. A similar profile, but at slightly lower levels throughout, is expected in the United States. Work by Aaronson *et al* (2006) assesses the impact of the changing age structure on participation rates in the United States and finds quite large effects tending to lower participation.

Chart 8 Old-age dependency ratio^(a)



Sources: ONS and US Census Bureau.

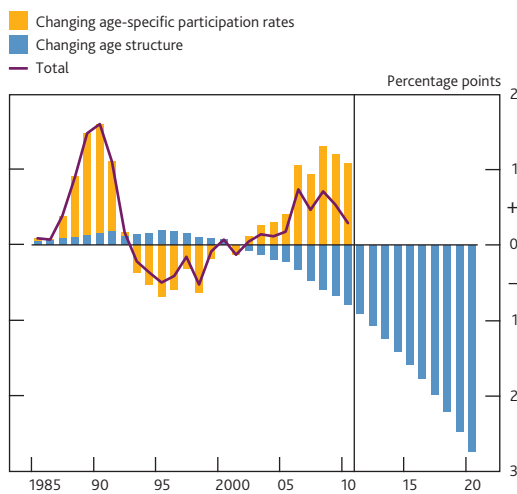
(a) Ratio of population aged 65 and over to 16–64 population. Projections from 2010 onwards.

A changing age structure may have a significant effect on the overall participation rate. The US labour force participation rate has declined in recent years since peaking in 2000. After reaching 67.3% in 2000 it declined steadily by a total of around 1.5 percentage points by 2005. Aaronson *et al* (2006) suggested that much of the decline immediately after 2001 was due to cyclical factors. Cyclical factors may have also

been at work more recently as the US participation rate dipped below 65%. But through this period Aaronson *et al* (2006) also suggest the changing age structure has been important and that could continue in the United States, with future cyclical moves occurring around a declining trend in the participation rate.⁽¹⁾

The age structure is ‘slow moving’, changes are rarely large year on year. But those changes may cumulate over time to something more pronounced.⁽²⁾ And the unprecedented changes in the age structure — alongside the strong life-cycle profile in participation that was described earlier — imply that there is scope for population ageing to have an important influence on the aggregate participation rate over time. All else the same, the projected changes to the age structure could, cumulatively, lower the aggregate participation rate by 2 percentage points by 2020, compared with 2010 (Chart 9). This of course reflects the pattern described earlier: more of the population is projected to be at those ages where participation rates are lower.

Chart 9 Contributions to cumulative changes in aggregate participation since 1984^(a)



Sources: ONS (including the Labour Force Survey) and Bank calculations.

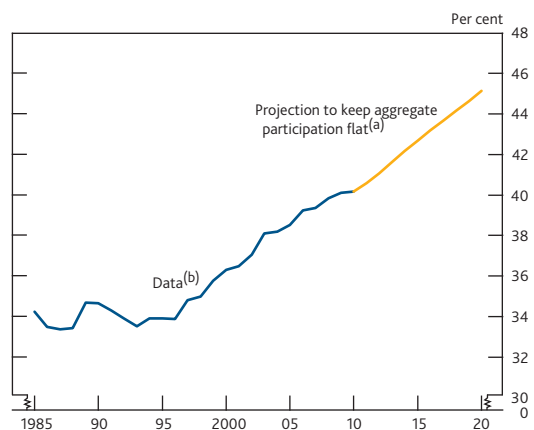
(a) Annual data for the three months to June. Contribution of the changing age structure up to 2010 is constructed using the LFS microdata by calculating the difference between the actual participation rate in each year and a measure of the participation rate using current year age-specific participation rates and population weights from the previous year. The demographic contribution prior to 1992 is calculated using data for the three months to May. The contribution from changing age-specific participation rates is calculated as a residual. Beyond 2010, projections for the impact of the changing age structure are calculated by assuming that age-specific participation rates remain at 2010 levels and that the age structure of the population evolves in line with ONS population projections.

The ‘composition effect’ associated with changing demographics and illustrated in Chart 9 is not the end of the story, of course. In recent years, there have been more than offsetting ‘behavioural effects’, meaning that at a given age, participation rates have been increasing, as employees have been delaying their retirement relative to earlier cohorts. This is another source of uncertainty. The contribution of those changes to the age-specific participation rates is also shown in Chart 9. As the compositional effect increases in importance in future years, reflecting the change in age structure of the

population, this offsetting behavioural effect would need to increase in size for the participation rate to remain stable. Of course there is also some uncertainty around the precise nature of the changing age structure, although this relates to how large the downward influence of demographics will be, not whether these effects will be negative or not.

How large an offset from rising participation rates, particularly among older groups might we need or expect to see for this to offset the changing age structure of the population? Chart 10 shows a stylised scenario which demonstrates the likely size of the increase in the participation rates of older workers that would be required to offset the demographic effects shown in Chart 9 and keep the aggregate participation rate flat. That suggests that little more than a continuation of recent trends seen over the past decade would offset the effects of the changing age structure. However, in addition to the clear uncertainty present in any calculations of this kind, it should also be noted that the increases in participation rate of older workers over the past decade were much larger than in the 1990s.

Chart 10 Participation rate among those aged 50+



Sources: ONS (including the Labour Force Survey) and Bank calculations.

(a) The participation rate at each age between 50 and 74 is assumed to increase by the same number of percentage points in each year in order to keep the aggregate participation rate at its 2010 level. Participation rates for those aged 22 to 49 and those aged 75 and over are assumed to remain at 2010 levels. Participation rates for those aged 16 to 21 are assumed to fall at the same rate as between 2000 and 2010. The age structure of the population is assumed to evolve in line with the ONS population projections.
 (b) Annual data. Based on data for the three months to June between 1992 and 2010 and the three months to May between 1984 and 1991. Data are non seasonally adjusted.

Although the scale of the increase in older-worker participation rates that would be required to offset the impact of population ageing on the overall participation rate may be quite large, it does not appear implausible. Moreover, the scenario assumes that the recent downward trend in participation rates among the young continues. Those

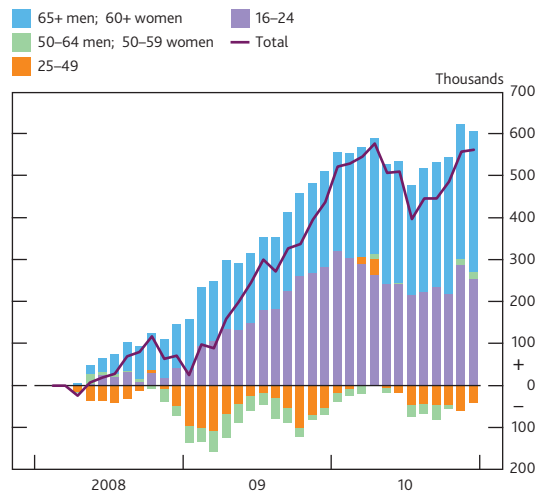
(1) The ‘old-age dependency ratio’ does not pick up all of these changes in the age structure. For example, participation rates generally fall through ages 50–64. So changes in the population proportion at these ages also affect participation without being reflected in a higher old-age dependency ratio.
 (2) See Miles (1999) and Young (2002) for studies of how projected changes to UK demographics might affect the UK economy.

pronounced trends (Charts 4 and 5) could slow. In the illustrative scenario, the participation rates of those aged between 22 and 49 remain at 2010 levels. Higher participation among these groups would reduce the increase in older-worker participation needed to keep the overall participation rate stable. Clearly, there are many scenarios that might be considered. And for the aggregate participation rate to decline slightly — as it did at several points in the past — need not represent a problem for the economy.

The latest labour market data also point to the start of the changing age structure and its effect on the participation rate. The latest data suggest both the presence of the behavioural effect — older people extending their working lives — and the compositional effect associated with greater numbers of older people with a lower participation rate than younger people. Chart 6 showed that participation rates of older workers have risen since the onset of the recent recession. But Chart 11 shows that — despite those rising participation rates — the numbers of inactive older persons has been rising — reflecting the greater numbers of older people in the population.

The findings echo results found for the United States and the euro area (see Aaronson *et al* (2006) and Balleer *et al* (2009), respectively). A changing age structure may, by itself, have a downward effect on the participation rate. Age-specific participation rates will be affected by a range of influences, and these may differ across these economies. In the United Kingdom, several of these influences, including those discussed in this article, will tend to raise the aggregate participation rate by raising the participation rate at a particular age — and especially so at older ages.

Chart 11 Changes in inactivity by age since 2008 Q1



Source: Labour Force Survey.

Conclusion

This article has described an approach to understanding an important aspect of labour supply — the participation rate. That approach exploits the variation in several million individuals' participation decisions. The discussion has highlighted the range of influences — both disaggregated and aggregate — that are likely to shape the outlook for labour force participation in the United Kingdom. How the participation rate evolves in the medium term is likely to depend on whether some disaggregated trends in participation continue and how those trends are affected by, among other things, the recession.

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