BANK OF ENGLAND

Speech

Some effects of demographic change on the UK economy

Speech given by

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CBI Annual Economic Dinner 2018

MacDonald Bath Spa Hotel

22 November 2018

The views expressed here are not necessarily those of the Bank of England or the Monetary Policy Committee. I would like to thank Lena Anayi, Tom Belsham, Tomas Key, Clare Macallan, Mette Nielsen, Chris Redl, Emma Rockall, Rana Sajedi, Brad Speigner, Michal Stelmach, Matt Swannell, Silvana Tenreyro and Alex Tuckett.

The UK is experiencing major demographic changes from population ageing, reflecting rising life expectancy and the maturing baby boom generation. These trends probably do not significantly affect the economy's growth rate from quarter to quarter. But demographic trends are causing deep structural changes in the economy. In the last 10-15 years, these effects from population ageing have been fairly benign, reducing the equilibrium jobless rate and neutral interest rate. However, effects of population ageing will become more challenging in the next 5-10 years, with greater downward effects on labour supply and, possibly, productivity. If the UK is to avoid a further slowdown in potential economic growth, productivity growth will need to pick up, which will probably require continued investment in physical and human capital.[i]

The early phase of population ageing – expansion of the 40+ and 50+ age groups – has been underway for some time. Twenty five years ago, the number of people aged 20-49 years was roughly 40% greater than the number aged 50 years or over. Now the two groups are almost the same size. The cross over point will come in the next three or four years,[ii] with – probably for the first time ever – more people aged 50+ years than 20-49 (see figure 1).[iii]

The UK has now entered the middle phase of population ageing, with rapid growth in the 60+ and 70+ age groups (see figure 2). The late phase, with rapid growth of the population aged 80+ years, will start in the mid-2020s.

These ageing trends are widespread across advanced economies and some emerging markets. The point at which the 50+ population exceeds the 20-49 population occurred more than 10 years ago in Japan and in the last few years in Germany, France and Italy.[iv] Canada will get there in 2020-25, China around 2030. In some countries, for example Japan, E Europe and S Europe, ageing is being accompanied by outright population decline (see figure 3). That is not the case for the UK. On central estimates, the UK population will continue to grow in coming decades, albeit more slowly than recently.

While these broad demographic trends are pretty much definite, there are some uncertainties in the exact profile, in particular regarding migration. The UK projections above use the ONS central estimate. If we use the ONS low migration variant,[v] population growth over the next 10 years would be 0.3-0.4% per year, roughly half the central projection. Moreover, since migrants tend to be younger than the existing population, lower inward migration would imply faster population ageing.

It may seem tempting to compress demographic change into one statistic, such as the dependency ratio.[vi] But, in practice, the economic effects of ageing occur at different stages. For example, the early stage of population ageing (rising share of the 40+ and 50+ population) tends to lift private savings and hence depress real interest rates. Downward effects on workforce participation are driven more by the 60+ share and 65+ share – the middle stage of ageing – and hence occur a little later. The late stage of population ageing (rising 80+ share) will tend to have larger effects on public spending on health and social care.[vii]

Demographic change affects the economy in a range of ways.[viii] I want to focus on labour market effects – the equilibrium jobless rate, labour supply and productivity – as well as effects on interest rates and monetary policy. Some are already evident. Others may develop with more force over coming years.

Most of the effects of ageing discussed in this speech are compositional effects. In aggregate, older people have different patterns of work, spending and saving than younger people and so a rise in the population share of older people can affect how the economy works.

These effects may be reinforced, or countered, by behavioural changes. Some of these may reflect reactions to population ageing, including through shifts in government policies on, for example, pensions, retirement and benefits. We also need to allow for other behavioural changes, especially from rising education attainment. Over the last 25 years, the share of the 25-64 age population with tertiary level (ie university or similar) education has risen from 19% to 43%, a bigger rise than in most advanced economies (see figure 4).[ix] The tertiary education share among people aged 25-40 years is now around 50%, and the rise in this measure has slowed in recent years. But even if this levels off, the tertiary education share among all people aged 25-64 years will keep rising – albeit more slowly – getting close to 50% in 2030, as highly educated younger cohorts get older. This rise in education attainment will offset or delay the economic effects of population ageing in some respects (eg participation, productivity) but magnify it in others (eg equilibrium unemployment).

Let's start with the **labour market.** Population ageing has probably reinforced other factors pushing down the **equilibrium jobless rate**, U*.[x] Jobless rates for younger workers – aged below 35 years – tend to be persistently higher and fluctuate more with economic conditions than jobless rates for older workers (see figure 5). Younger people are often still finding the occupation that suits them best – a process known as 'job shopping' – and more likely to be in a job that is a poor fit for their attributes and abilities.[xi] In addition, younger people are often still acquiring skills and experience, and jobless rates for less-skilled workers tend to rise relatively sharply in downturns. The result is that the flows of people between employment and unemployment are relatively high for younger age groups, with a higher share out of work at any point and bigger swings over the economic cycle. Conversely, older workers are less likely to lose their job and if they do, they are more likely (than young people) to become self-employed as an alternative to unemployment.

With population ageing, the share of the workforce aged under 35 years is down from 46% in 1990 to 40% in 2000 and 36% now. This shift in workforce composition away from age groups that tend to have high jobless rates has cut the equilibrium jobless rate by about 0.3 percentage point since 2007 and by about 1pp since 1990.[xii] This is probably smaller than the effects from wider education attainment,[xiii] but goes the same way.

Although the workforce will keep ageing, the effects on U* may not actually increase much in coming years. This is because the big difference in jobless rates is between the under 35s and the rest of the workforce, and most of the drop in the under 35s in the workforce already occurred. Population ageing in coming years

will lift the share of the over 55s in the workforce, and cut the share of people aged 45-54 years. But in terms of jobless rates, differences between people in their 40s, 50s and 60s are not that large.

Demographic change might also reduce labour supply growth, partly through lower population growth but especially through lower workforce participation.[xiv] Participation rates are relatively low among younger people, because many are in full-time education. Participation tends to be high between 25 and 54 years (often called 'prime working age'), much lower for people in their 60s, and close to zero above 75 years (see figure 6).

Between the early 1980s and the mid-1990s, demographic change lifted participation, because the population shares of prime working age groups were rising, with a falling share of under 25s (see figure 7). More recently, the rise in the older part of the population has started to reduce participation, with an effect of just over 1½pp over the last 10 years (ie just over 0.15pp per year).[xv]

However, this has been offset by two major factors. First, the female state pension age (SPA) has risen from 60 to 65 years – a change that began in 2010 and completed this month. Research by the IFS[xvi] suggests this has lifted workforce participation among women aged 60-64 years by about 10pp, adding 0.3-0.4pp to the total participation rate. And second, the rise in education attainment noted earlier. At most age groups, especially among women, higher education attainment lifts workforce participation, probably reflecting the extent to which education opens doors to higher pay and wider job opportunities (see figure 8).[xvii] Using a simple model, I estimate that rising education attainment has lifted participation by roughly 1½pp over the last 10 years.[xviii] With these large effects from the SPA and education, the participation rate edged up over the last 10 years despite adverse demographics. Cyclical conditions reduced participation between 2008 and 2013, but this effect largely unwound since then as the economy recovered. Other factors probably also affected participation among specific groups of the population, including rising longevity, changes in annuity rates, benefit legislation and health, but have played a lesser role in aggregate over that period (see figures 9 and 10).[xix]

Looking ahead, the adverse effects on participation from ageing will expand as the population shares of the over 60s and over 70s rise markedly. The population of prime working age has risen by about ½% per year over the last 10 years but will fall slightly from 2020 onwards. Our simple model suggests that ageing will cut the participation rate by about 3pp over the next ten years (ie 0.3pp per year) – considerably more than the effect over the last 10 years.

Pushing against this, age-specific participation rates are likely to continue to rise, especially for older workers. The SPA for men and women is rising from 65 years to 66 years over the next two years, starting next month, with a further rise to 67 years scheduled for 2026-28.[xx] The rise in the SPA – assuming it has similar effects to the recent changes – will add 0.1-0.2pp to aggregate participation over the next two years. The rising tertiary education share will also continue to lift participation, although this effect may be less

powerful than recently, because the tertiary education share will probably rise more slowly (given that the rise among younger age groups has already slowed).

Combining these, this model suggests that in 2019-20, the rise in age-specific participation rates – and especially from the rising SPA – will continue to offset effects of population ageing, with participation roughly stable and workforce growth matching population growth at about 0.6% per year. Beyond that, with no further changes in the SPA scheduled until 2026-28, the effects of ageing will dominate, with the participation rate falling by 0.2-0.3pp per year and workforce growth slowing to about 0.3% per year (such that the participation rate falls by about 2pp in total over the next 10 years), see figure 11.[xxi]

If we use the ONS low migration variant, the combined effects of ageing, education and the rise in the SPA would imply roughly zero workforce growth from 2020 onwards.[xxii]

Under either migration path, the slowdown in labour supply may be reinforced slightly by trends in average hours, given that the over 60s tend to work significantly fewer hours than other age groups, with a higher share of part-time work.[xxiii]

I want to stress caveats here. The rise in the State Pension Age to 66 and then 67 years may have bigger or smaller effects than the rise from 60 to 65 years. It also is possible that rising life expectancy will have greater behavioural effects on labour supply, with people choosing to stay in the workforce for longer, or to work more hours, beyond effects from changes to the pension age and education. So far, such effects do not appear to have been large in aggregate. As noted earlier, a simple model based purely on education, spare capacity and changes in the pension age tracks recent trends in participation fairly well. Moreover, among those in work, there is a clear preference in the 55-64 and 65+ age groups to work fewer hours rather than more hours (for the same hourly pay), see figure 12.[xxiv] But it is certainly possible that ageing will generate a bigger labour supply response over time.

Let me turn to **productivity growth.** Some research suggests that ageing is likely to hit productivity, not just through a shorter average work week (which might cut output per person) but by reducing output per hour.[xxv] For example, as people get older, at some point the advantages of work experience may be offset by depreciation of knowledge and skills, and reduced innovation.[xxvi] The balance between these effects probably varies across different industries and different types of work. Older workers tend to move job much less frequently than younger workers and hence population ageing may impede the diffusion of skills, knowledge and technology use through reduced job-to-job flows.[xxvii] Against that, some research suggests that when population ageing eventually reduces labour supply, labour scarcity will prompt greater investment in labour-saving technology and automation that will boost productivity.[xxviii]

There is considerable debate over the causes of the UK's recent productivity slowdown.[xxix] The fact that productivity growth has slowed as population ageing kicks in might seem to indicate some link. But, in my view, evidence that ageing has played a big role in the UK productivity slowdown is not clear cut.

For example, productivity growth (output per hour) in 2010-16 slowed from the pre-crisis average (1999-2007) in all of the UK's 12 regions. But there is little link between regional trends in productivity and ageing. Indeed, productivity slowed by *more* in regions which had a relatively *small* rise in the share of over 50s in total employment or in the population (eg London), see figure 13. There also is little link between regional changes in demographics and productivity growth at a sectoral level, for example if we compare productivity growth in the manufacturing or financial services sectors in different regions (see figure 14).[xxx]

Some research that links ageing to weaker productivity growth is based on the observation that in many countries, pay shows a marked hump-shaped profile across age groups. The UK is fairly typical in this respect. Median hourly pay peaks at 40-49 years, falls 7-8% for the 50-59 age group and more than 20% for the 60+ age group (see figure 15). If you assume an individual's pay roughly reflects their productivity, then at first glance these data hint at a marked age-related deterioration in productivity from 50 years onwards – the age group that has recently been growing rapidly.

However, in the UK, the lower level of pay among the over 50s largely reflects lower average education attainment for this age group rather than any inherent age-related decline.[xxxi] Among those with the same education, people aged 50-59 years earn roughly the same as those aged 40-49 years and more than people aged 30-39 years (see figure 16).[xxxii] Once you allow for education, the notion that there is a major drop off in productivity beyond 50 years does not seem valid in the UK.

Taking people of similar education, adverse effects of ageing on pay are modest and confined to people aged 60+, with median hourly pay for this age group about 10% below that of people aged 40-49 years.[xxxiii] This gap has shrunk over time, especially for those without tertiary education, perhaps because fewer jobs need hard manual labour and the general health of older people has improved.[xxxiv] Given that the share of over 60s in total employment is still relatively low (10% now, versus 8% ten years ago), the possible productivity shortfall among this age group has probably had only a modest effect on aggregate productivity growth in recent years. Again, these data do not suggest that ageing has been a major factor in the UK's recent productivity slowdown.

Nevertheless, while population ageing probably has not been a major factor in the recent productivity slowdown, it is hard to see how population ageing will be positive for human capital in coming years. And, with soft trends in firms' investment intentions, there is not much support to productivity from investment in physical capital either.

Savings and real interest rates

Let's turn to implications for household saving and real interest rates. Some commentators have argued that population ageing is likely to lift real interest rates, because the rising share of retirees will reduce household saving.[xxxv] However, the MPC judges that, in practice, population ageing currently is lifting the stock of household assets, both in the UK and globally – and hence is pushing the equilibrium level of global real interest rates lower, and will continue to do so for some time.[xxxvi]

Life cycle theory suggests that people tend to borrow more in the younger part of their working years, accumulate assets during the latter part of their working years and run down their wealth in retirement. This is broadly what you see in the data, both for the UK and other advanced economies.[xxxvii] Debt is higher among younger households (see figure 17), whereas average household wealth follows a hump-shaped path – peaking around 55-74 years and falling beyond that (see figure 18). At the moment, population ageing means that a rising share of the population is in age groups with relatively high wealth levels (ie 45-74 years), hence lifting the equilibrium stock of savings.

In addition, perhaps in response to rising life expectancy, people on the whole seem to be deferring the point at which they usually run down their wealth. For example, the average wealth of households aged 65-74 years is higher, relative to other households, than used to be the case.

These effects may be reinforced if, in response to rising life expectancy, people aim for a higher level of savings to finance a longer period of retirement and age-related costs such as social care. It is hard to disentangle this from other factors that may lift people's desired savings (eg risk aversion, bequest motives, accumulating funds for a deposit on a mortgage). But it is notable that the balance of households who believe it is a 'good time to save' has risen close to its long-run average even though interest rates remain relatively low in real and nominal terms (see figure 19).

For an individual open country, a higher stock of savings would produce an accumulation of external assets. With a similar ageing trend across many countries, the combined effect is to push down on the global equilibrium real interest rate, and this effect could be reinforced if anticipation of lower population growth reduces capital spending growth.

Much of this demographic effect on equilibrium interest rates already occurred. From later next decade, this aspect of demographics will not intensify further as the share of the 75+ and 80+ population – age groups at which households are usually running down their wealth in a significant way – rises significantly (see figure 20).

Ageing may also have some effects on the **monetary transmission mechanism**.

A key part of the process whereby interest rate changes affect spending in the economy is through cashflow effects on borrowers, who face rising debt service costs if interest rates rise, and hence adjust their spending. Given the distribution of debts and assets, these effects largely come through people with mortgages and households aged under 45 years or so. These are the groups that typically have relatively high debts compared to income. Moreover, because younger households tend to have relatively low levels of savings, they are generally more affected by changes in credit availability and less able to smooth their spending in the face of cashflow effects. As a result, changes in interest payments have a relatively high impact on their spending (see figures 21 and 22).[xxxviii]

Conversely, the direct effects of interest rate changes on aggregate spending of households aged 55+ years are relatively small. Older people typically have less debt but more assets, and in aggregate benefit in cashflow terms from higher rates. However, people with net savings tend to not adjust spending much in response to changes in interest income.

Given the different spending responses by borrowers (who are generally relatively young) and savers (who are generally older), a rise in interest rates lowers spending in aggregate. Of course, the full impact of monetary policy changes, allowing for knock-on effects to incomes, jobs and asset prices, are more complex and their distributional effects are more balanced.[xxxix]

Ageing might affect this part of the monetary transmission mechanism – the cashflow channel – in two ways.

The first is that, as the population ages, older people – whose spending is less affected by the cashflow channel – account for a rising share of the population, incomes, wealth and spending.[xl] Since 2001, the share of consumer spending done by people aged 50 years or older is up from 41% to 52%, while their share in spending on consumer durables is up from 38% to 54% (see figure 23).[xli]

The second is that ageing, along with other factors, has produced marked changes in the aggregate household balance sheet, which might affect the sensitivity of the typical household within each age group. The share of households with a mortgage is down from 42% in 2000 to 28% – the lowest for at least 35 years – with a sharp drop among young people (see figure 24).[xlii] Conversely, the ratio of household wealth to income has risen sharply. Most households that own their home have no mortgage.[xliii] These trends are partly the direct result of population ageing, with fewer young households and more elderly savers. But they are also indirect results from the interaction of the shift of wealth to older age groups with the reduced availability of high LTV mortgages, which has made it harder for people with low levels of assets (who are generally relatively young) to get a mortgage and buy a house.

Some research suggests that populating ageing has already reduced the effectiveness of monetary policy in advanced economies, so that a given deviation of interest rates from neutral has less impact on the economy than previously.[xliv] BoE research suggests that this is not the case for the UK so far, and that the total impact

of interest rate changes on growth and inflation is similar to the pre-crisis period.[xlv] The easing in mid-2016 seemed to provide the expected boost to the economy. To be sure, the NMG surveys suggest that the net change in households' income from rising interest rates has become slightly more positive in recent years.[xlvi] Such a trend, if sustained, might over time reduce the direct effects on spending of interest rate changes. But, this is only one of the ways that interest rate changes affect demand in the economy. Given the rise in the household wealth-income ratio, in my view it also is possible that consumer spending might become more sensitive to indirect effects of monetary policy changes on asset prices.[xlvii]

Clearly this is an issue that needs watching. If the monetary transmission mechanism does become less powerful then, all else equal, monetary policy might need to be more active around a neutral stance to stabilise the economy in the face of demand shocks.

To sum up on demographics, although population ageing is a multi-decade trend, it is affecting the economy now and will continue to do so in coming years.

I want to finish with some brief comments on the outlook for the **economy and monetary policy**.

For most of the last 10 years, the economy has generally had significant amounts of spare capacity. Under those conditions, it has been appropriate to provide considerable monetary stimulus, in order to support growth above potential and thereby prevent the economy getting stuck in a rut of low capacity use and below-target inflation.

Now, with the economy having grown above its modest potential pace for six or seven years that spare capacity has been used up, with supply and demand in the economy broadly in balance.

Looking ahead, assuming the economy adjusts smoothly to an average of Brexit end states, economic growth is likely to continue to outpace potential, so that the economy moves into excess demand over the next year or two. As a result, assuming that smooth adjustment to Brexit, the MPC as a whole judge that some further rises in interest rates probably will be needed over time, in order to return to a more neutral policy stance and thereby keep inflation on target over time.

My own hunch is that, conditioned on our Brexit assumptions, capacity pressures will probably build somewhat faster than envisaged in our latest Inflation Report projections, reinforcing upward pressure on pay growth. In this case, we would probably need to return to something like a neutral stance rather earlier than implied by the current yield curve.

Nevertheless, that assumption of a smooth Brexit adjustment is itself uncertain. Recent business surveys, including those by the CBI, suggest that Brexit uncertainties have caused a marked drop in business confidence so far in Q4. This could be reflected in some weakness in near term activity data.

At least some of these Brexit uncertainties might be resolved quite soon. Either there will be a withdrawal agreement and transition period or not. If there is a withdrawal agreement then the range of options for the possible Brexit end state also may narrow.

Any such resolution of Brexit uncertainties may change the economic outlook, perhaps substantially. But the monetary policy implications of different Brexit outcomes could go either way, depending on the effects on supply, demand and the exchange rate.

For example, a smooth transition to a relatively close economic relationship with the EU would probably boost business confidence, with pent-up demand propelling investment and hiring. The same factors might well cause sterling to appreciate. The net effect would probably be higher growth and lower inflation than our base case. But it is unclear whether it would be appropriate to tighten monetary policy more or less than implied by the current yield curve (or indeed not adjust policy at all, or to loosen): this would depend on the balance between potentially inflationary effects from stronger growth (relative to potential) and disinflationary effects from a stronger pound.

Conversely, an early move to WTO trading rules with no transition would probably see business confidence weaken, hitting investment and hiring. There might also be further adverse effects on potential growth.[xlviii] For the same reasons, sterling would probably depreciate, with the resultant boost to inflation reinforced by any extension of tariffs. The net effect would probably be higher inflation and lower growth, and it may be hard to tell in real time whether any weakness in growth exceeds the deterioration in potential growth. The monetary policy implications could go in either direction.

Monetary policy cannot prevent the necessary adjustment in the economy to EU exit. What monetary policy will do is to remain focused on its primary objective of maintaining price stability, and by doing so to contribute to broader stability in the economy as a whole.

Charts

Figure 1. Selected Countries – Share of Adult (20+ years) Population Aged 50+ Years, 1950-2030P

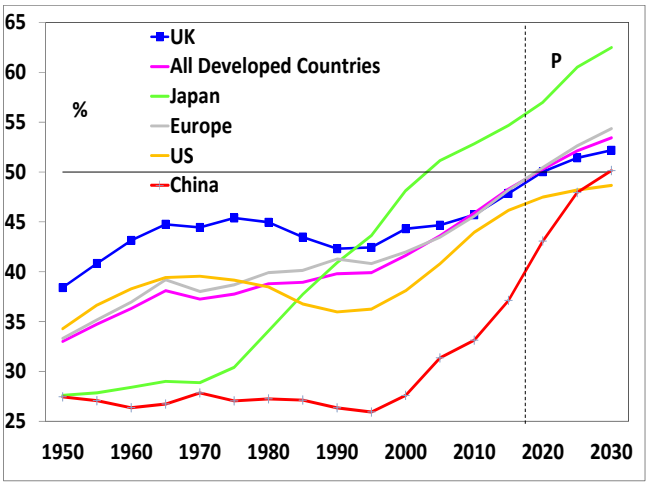
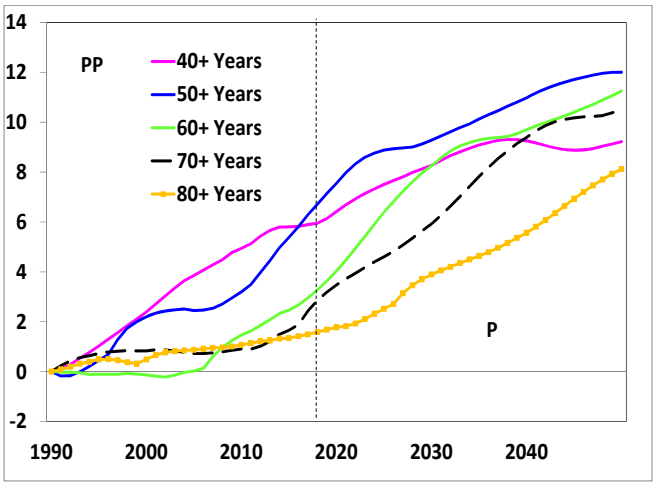


Figure 2. UK – Change in Shares of Adult Population (From 1990) of Selected Age Groups, 1990-2050P



P Projection. The left chart uses the UN central projections. The right chart uses the ONS central projection, and shows the change from 1990 in the population shares of various age groups, all as a percentage of total 18+ population. Sources: United Nations, ONS and Bank of England.

Figure 3. Selected Countries – Average Annual Population Growth, 2000-30P

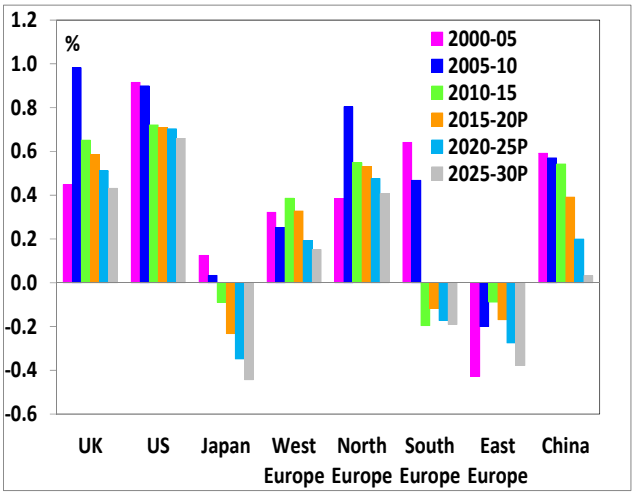
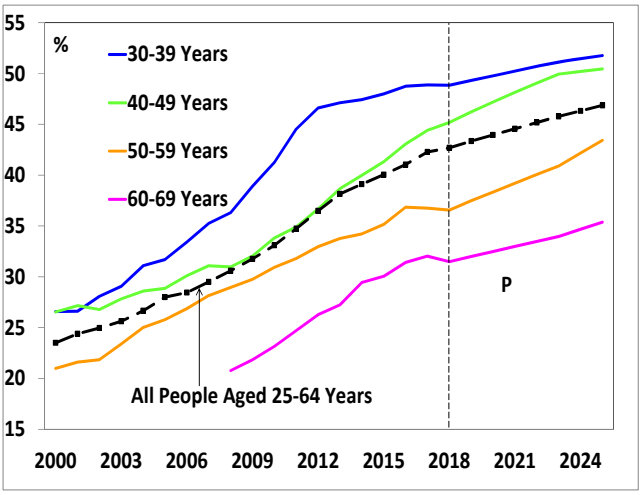


Figure 4. UK – Share of Population With Tertiary Education, 2000-2030P



P Projection. The right chart extrapolates recent trends in tertiary education shares by assuming the share for people aged 35-39 years follows that of people aged 30-34 years five years earlier etc. Sources: United Nations, ONS, Eurostat and Bank of England.

Figure 5. UK – Jobless Rates By Age, 1997-2018

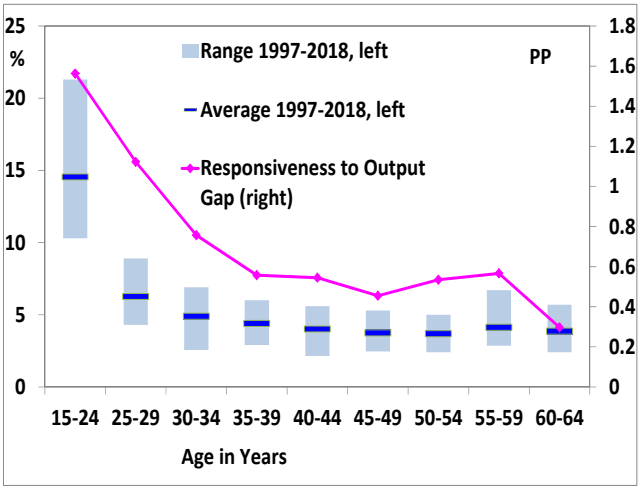
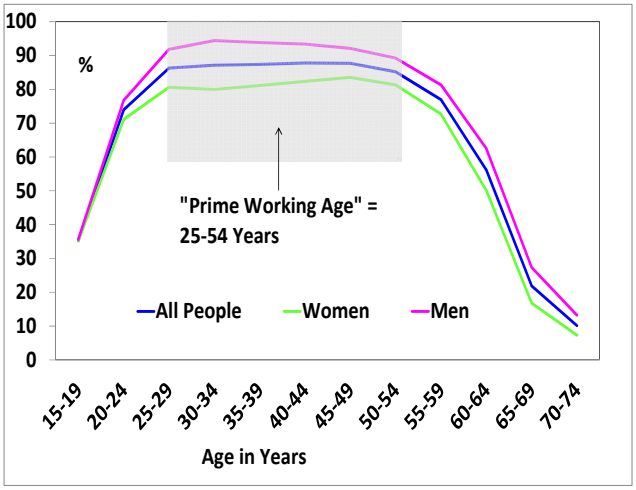


Figure 6. UK – Participation Rates By Age, 2018



Note: In both charts, the data are annual averages, with 2018 based on data for H1. In the left chart, the responsiveness to cyclical conditions is measured as the coefficient on the change in the jobless rate for each age group on the change in the output gap in the current year, lagged one year and lagged two years. Sources: Bank of England, Eurostat and ONS.

Figure 7. UK – Effects of Ageing on Participation Compared to 1971 Levels, 1970-2040

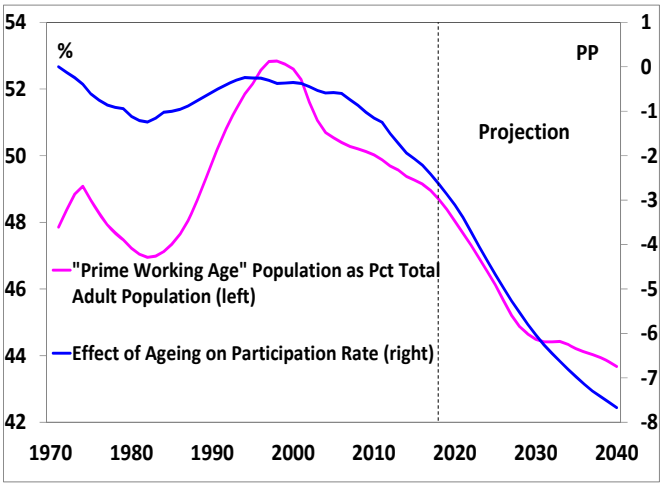
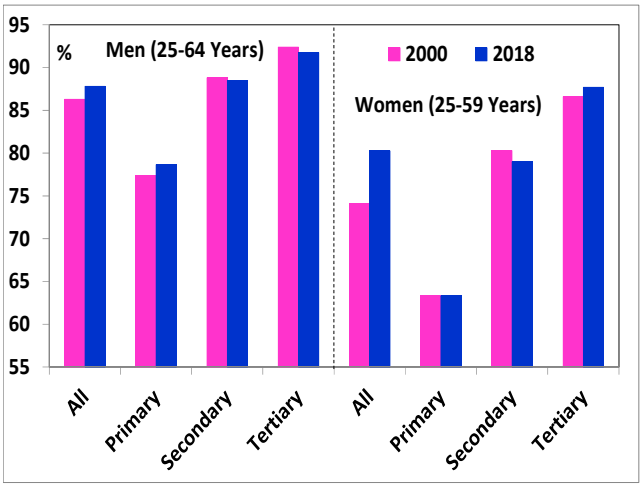


Figure 8. UK – Workforce Participation By Level of Education Attainment, 2000-2018



Note: The left chart shows the effects on the overall 15+ participation rate worked from population ageing, assuming that participation rates for each age and gender group are fixed at the average for 1983-2018H1. In the right chart, we group people by their highest level of education attainment. Sources: Bank of England, Eurostat and ONS.

Figure 9. UK – Breakdown of Changes to 15+ Participation Rate Over Five-Year Periods, 2008-28P

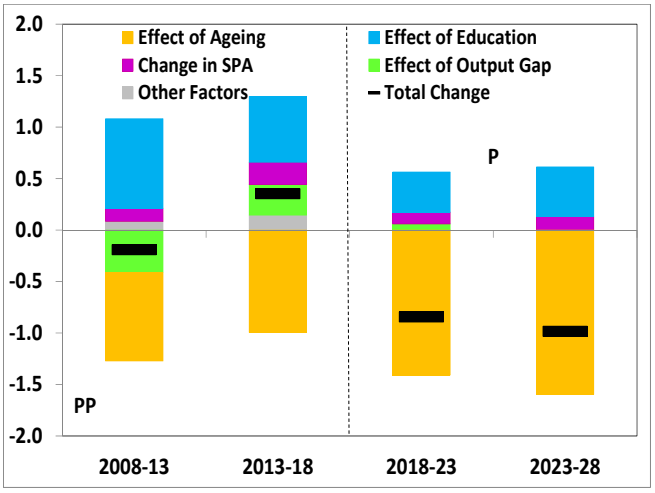
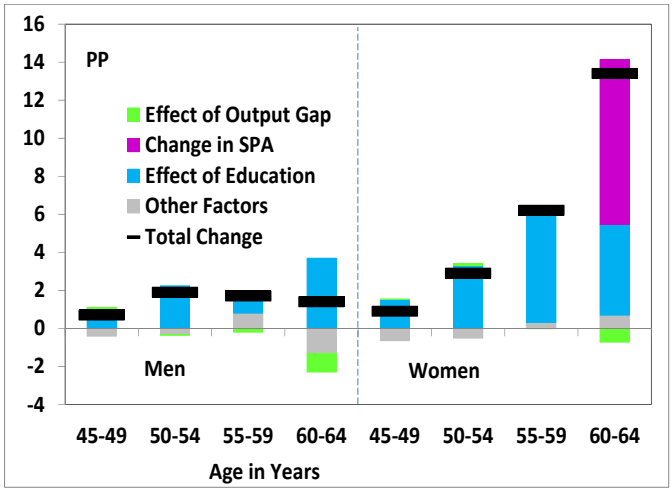


Figure 10. UK – Breakdown of Changes to Workforce Participation Rates By Age Group, 2008-17



Note: Both charts show annual averages. P Projection. Sources: Bank of England, Eurostat and ONS.

Figure 11. UK – Population and Workforce YoY, With Alternative Migration Assumptions, 2010-2030P

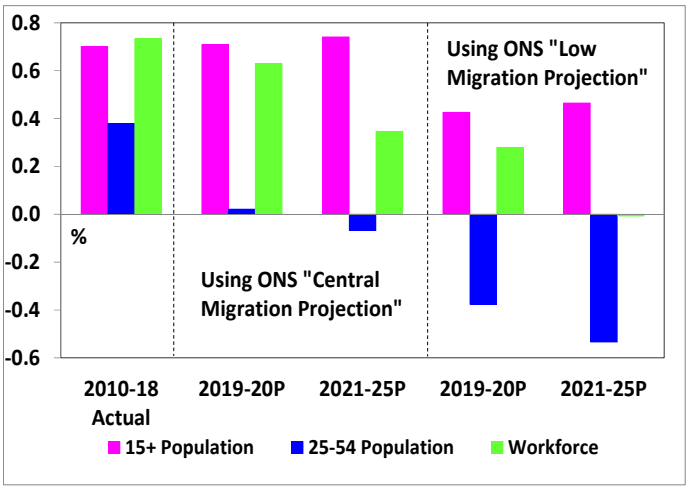
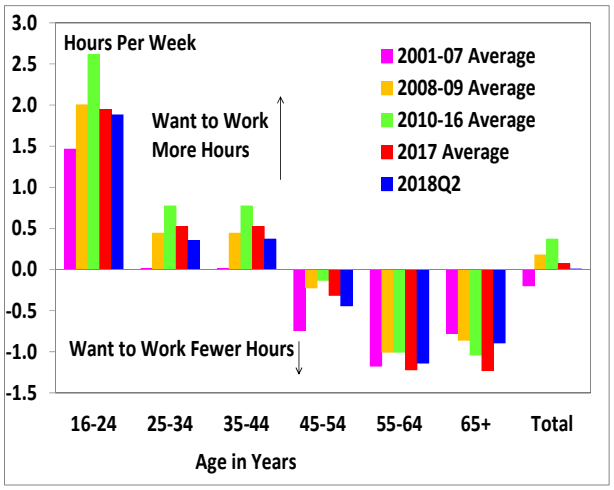


Figure 12. UK – Under/Over Employment By Age Group, 2001-18



Note: The right chart shows the gap (in hours per person) between the number of desired extra hours work among people in that age group (for the same hourly pay) and the number of reduced hours (also for the same hourly pay). Sources: Bank of England, Eurostat and ONS.

Figure 13. UK – Change in 50+ Employment Share and Productivity Growth (2010-16 Average Compared to 1999-2007 Average)

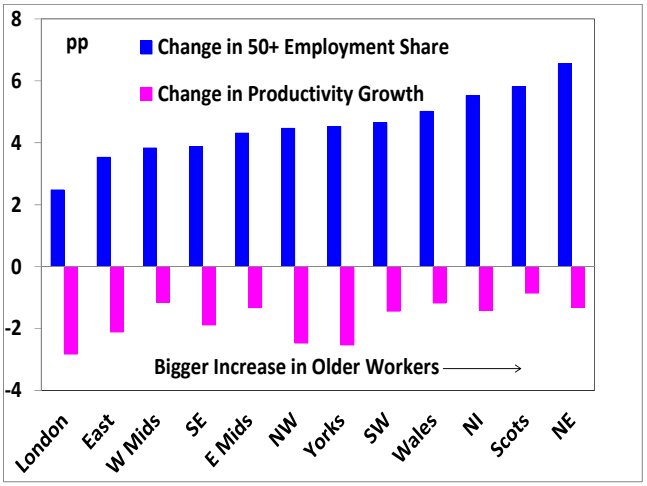
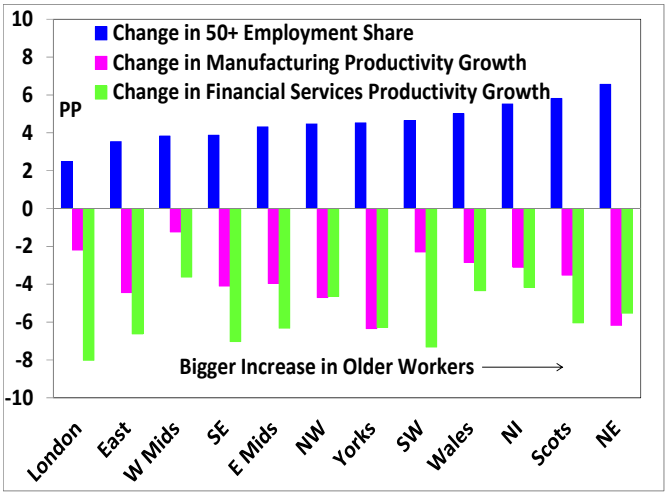


Figure 14. UK – Change in 50+ Employment Share and Productivity Growth in Selected Industries (2010-16 Average Compared to 1999-2007 Average)



Note: Productivity measured as output per hour. Sources: Bank of England and ONS.

Figure 15. UK – Median Hourly Earnings (as Pct 40-49 Year Age Group), Average for 2014-18

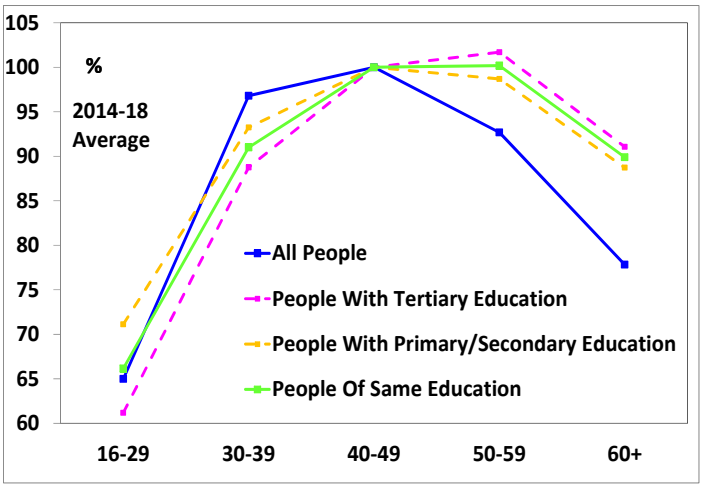
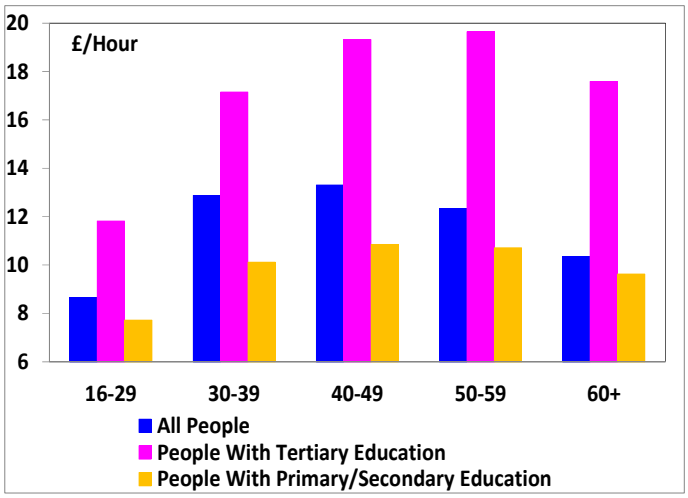


Figure 16. UK -- Median Gross Hourly Earnings (£ Per Hour), Average for 2014-2018



Note: For the left chart, the series for "people of the same education" is the average of the profiles for people with tertiary education and those with below-tertiary education. Sources: Bank of England and ONS.

Figure 17. UK – Average Household Debt By Age Group (as Pct Average for All Households), 2006-2016

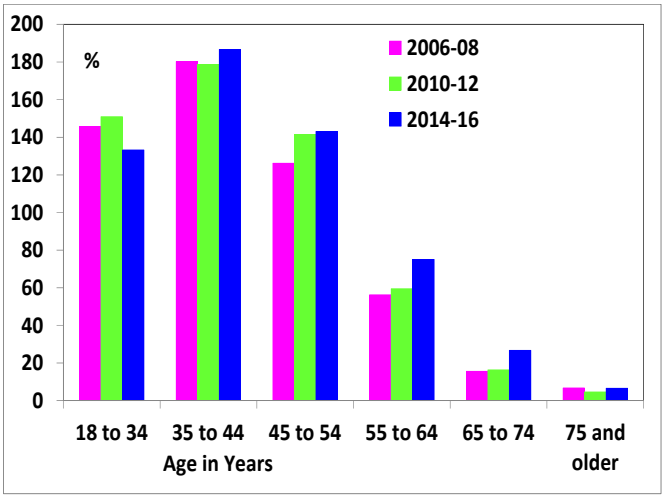
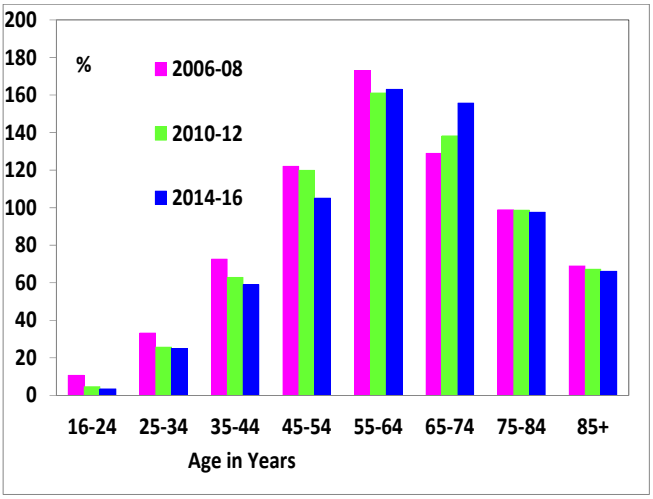
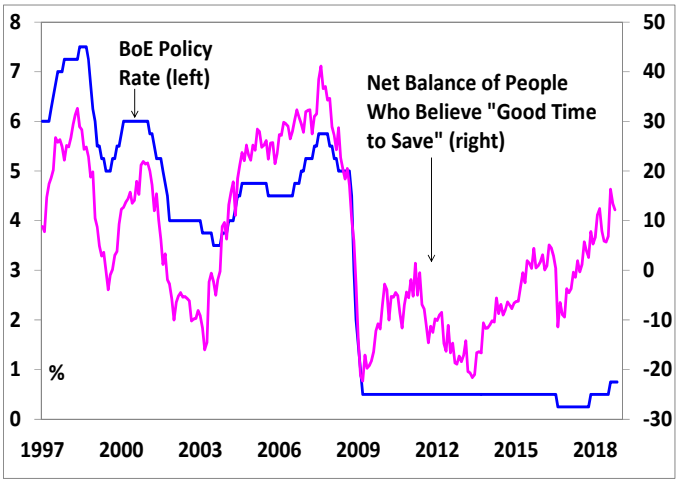


Figure 18. UK – Average Household Wealth By Age Group (As Pct Average for All Households), 2006-16



Note: Data from ONS Wealth and Assets Survey. In these charts, the position for each group is shown relative to the average for all households in that year. Average wealth of households aged 45-54 years has risen in real terms over the last 20 years. But it has risen by less than the average for all households and hence has fallen in relative terms Sources: Bank of England and ONS.

Figure 19. UK – BoE Bank Rate and Net Balance of People Who Believe It Is A Good Time to Save, 1997-2018



Sources: European Commission, ONS and Bank of England.

Figure 20. UK – Population Share Aged 45-74 Years and Real Yields, 1970-2040P

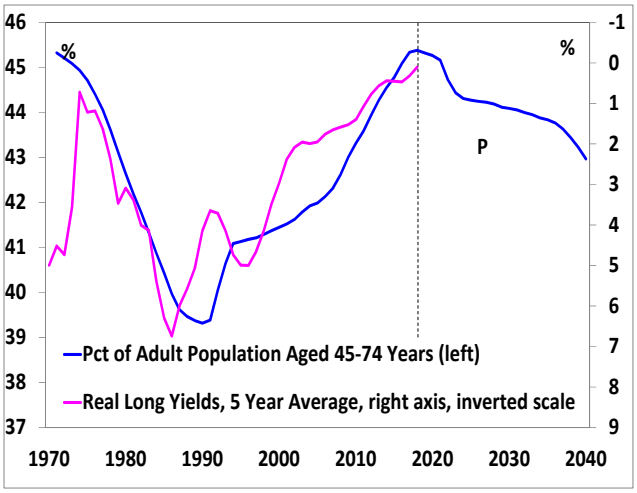


Figure 21. UK – Direct Impact of 1pp Change in Interest Rates on Household Cashflow and Spending By Age, Average for 2016-2018

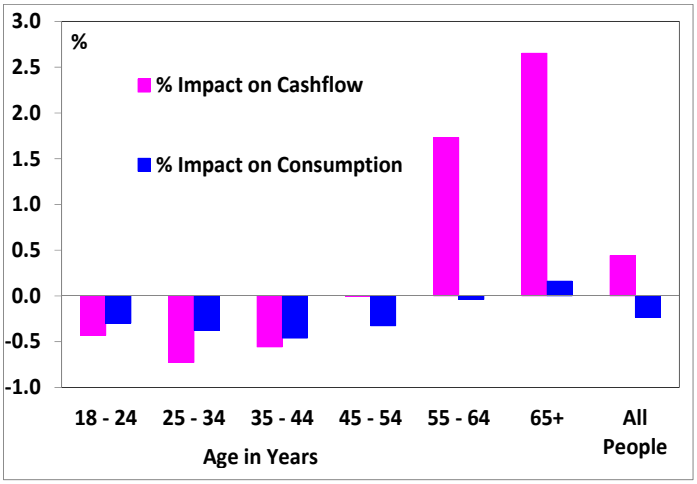
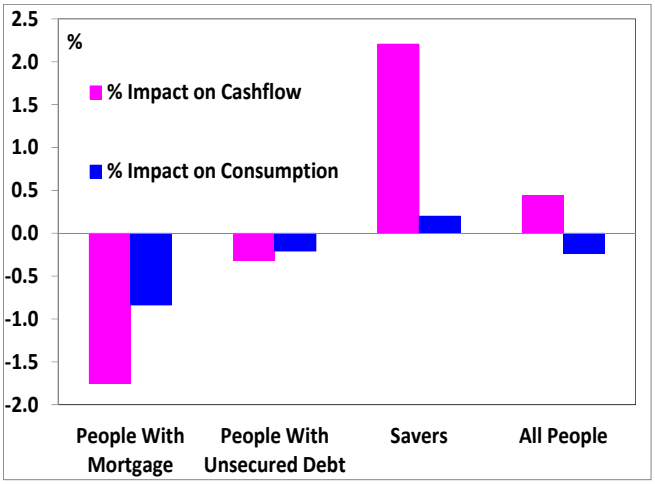


Figure 22. UK – Direct Impact of 1pp Change in Interest Rates on Household Cashflow and Spending, Average for 2016-2018



Note: The NMG results report the direct impact of a 1 percentage point rise in interest rates on the cashflow and spending of different age groups, defined by age of the head of household. Using reported data from the NMG survey, individual post-tax income is calculated before being aggregated to give a measure of household post-tax income. Household consumption is taken to be households' post-tax income less their reported annual savings. For each household the impact on cashflow is the net effect of a 1pp rise in the interest rate charged on their reported outstanding debts (allowing for whether that household has an interest-only or repayment mortgage) and a 1pp rise in the interest rate charged on their deposits. Those estimates are aggregated and scaled by current annual post-tax income. For each household, the impact on consumption is estimated as the change in interest payments/receipts multiplied by their reported marginal propensity to consume out of higher interest payments/receipts from the survey (please refer to 2017 Q4 Quarterly Bulletin article for more detail on how these MPCs are constructed). Those estimates are then aggregated and scaled by estimated current annual consumption. 'Savers' are defined as those whose net income change would be positive in response to a rise in interest rates, 'mortgagors' are defined as those with a mortgage whose net income change would be negative in response to a rise in interest rates, and 'unsecured borrowers' are those without a mortgage whose net income change would be negative in response to a rise in interest rates. Sources: Bank of England and ONS.

Figure 23. UK – Shares of Total Consumer Spending By Age Groups (Split By Head of Household), 2001-16

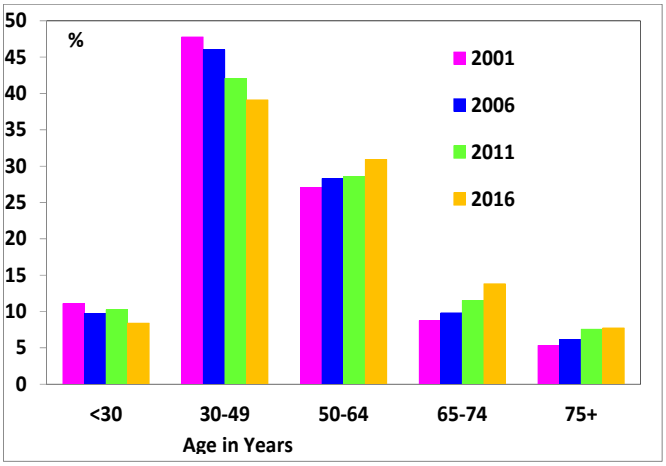
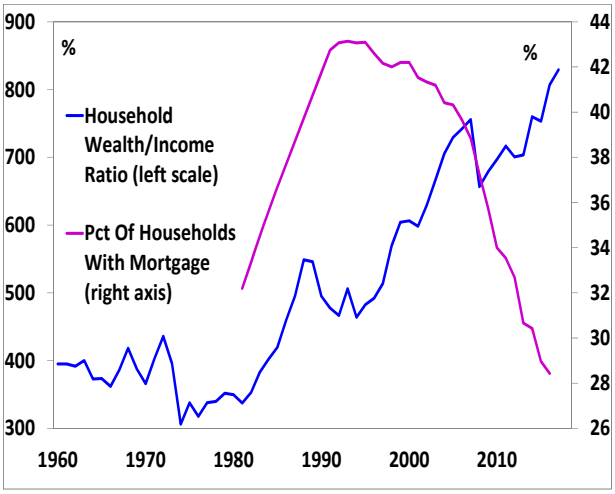


Figure 24. UK – Housing Tenure and Household Net Wealth/Income Ratio, 1960-2018



Note: In the left chart, data for 2001 and 2016 are for the 2001/02 and 2016/17 fiscal years respectively, 2006 and 2011 are calendar year data. In the right chart, the household wealth data are from various sources and more uncertain in early years. Sources: Bank of England, English Housing Survey and ONS.

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[i] See Gratton and Scott (2017).
[ii] Using the ONS central projection.
[iii] Based on UK data since 1953, and data for England and Wales since 1911. The 50+ share of the adult (20+) population was just 27% in 1911, and is unlikely to have exceeded 50% before that.
[iv] Based on UN population estimates. National sources may differ slightly.
[v] In the central assumption, net inward migration averages 200,000 per year over 2018/19 to 2021/22, 165,000 per year thereafter. In the low migration variant, net inward migration averages 120,000 per year over 2018/19 to 2021/22, 85,000 per year thereafter.
[vi] This is generally measured as the ratio of population outside working age to those of working age.
[vii] See OBR (2018).
[viii] See, for example, Nishimura (2012), Shirai (2012), Mester (2017), Aksoy *et al* (2016), Ferrero *et al* (2017).
[ix] Since 2000, the tertiary education share (people aged 25-64 years) has risen by 20pp in the UK. This compares to averages rises of 14pp for the EU and 15pp for the OECD. Among 34 advanced economies, only Ireland, Luxemburg, and Korea have seen a bigger rise in their tertiary education shares. Source: OECD.
[x] See Aaronson *et al* (2015).
[xi] See Gervais *et al* (2016).
[xii] I keep the jobless rate for each 5-year age group (20-24 etc) stable, and calculate the change in total unemployment driven by changes in the age split of the workforce.
[xiii] See Saunders (2017).
[xiv] Measured as the share of the 15+ population in the workforce.
[xv] For these estimates, I keep the participation rate for each 5-year age group (eg aged 20-24 years etc) stable (at the 1983-2018 average), and calculate the change in aggregate participation that results purely from changes in the age split of the population.
[xvi] See Cribb *et al* (2013) and ELSA (2018).
[xvii] See Grigoli *et al* (2018).
[xviii] I split the population into five-year groups (20-24, 25-29 etc) by age and gender, and estimate a simple regression model for participation of each group using education attainment (primary education share and tertiary education share for that age and gender) and the lagged output gap, with annual data over 2004-17. Due to data limitations, I extrapolate recent trends in participation for the 15-19, and 70-74 age groups. The education effect can be extrapolated from the coefficients and population trends. It may be hard to distinguish between effects of education on participation and other factors, including changes in social attitudes. But a shift-share analysis yields a similar estimate for the recent effects of rising education attainment on aggregate participation.
[xix] For example, among men lacking secondary education, participation rates have fallen since 2000 among those in their 20s and 30s, but risen at older age groups. The net change among the 25-59 age group is zero.
[xx] A further rise to 68 years is planned to take effect in the mid-2040s. The Government has announced its intention to bring that forward to 2037-2039, in line with the Cridland review.
[xxi] Within the working age (15-64 or 16-64 years) population, demographics actually lifted participation in recent years, because the share of the 60-64 age group (which has low participation) has fallen as the post-WW2 baby boomers move beyond 65 years. Of course, working age participation is unaffected by the rising population share of the over 65s. For the 15-64 age group, the combined effects of population ageing and education seem likely to lift participation slightly in the next year or two, before ageing effects dominate to push participation lower. However, the 15-64 population itself will grow quite slowly, only by 0.3% or so per year.
[xxii] Workforce growth would be correspondingly higher using the ONS's high migration variant (280,000 per year over 2018/19 to 2021/22, 245,000 per year thereafter).
[xxiii] For example, among men that work, the average work week falls from around 37 hours for the 50-54 year age group to 35 hours for the 55-59 group, 32 hours for the 60-64 group and 25 hours for the 65-69 group. The decline among women is similar, from 27 hours per week for the 55-59 age group to 23 hours for the 60-64 age group. Even if we allow for the effects of education attainment, ageing is likely to reduce average hours slightly (by less than 0.1% per year) over the next 10 years.
[xxiv] On average, people aged 55-64 and 65+ years want to work about an hour per week less than at present. Similarly, among people aged 65 years or over, the share that are outside the workforce but would like to work is down from 1.5% at start of 2015 to just 0.9% now, the lowest since 2006.
[xxv] See Feyrer (2007 and 2008), Aksoy *et al* (2016), Aiyar *et al* (2016), Maestas *et al* (2016), Liu and Westelius (2017), and Jones (2018).
[xxvi] There is evidence that innovation peaks at 40-50 years on average, see Jones (2010), and Nager *et al* (2016).

[xxvii] It may be that older workers are less willing to change job, or that firms are more reluctant to hire them.
[xxviii] See Acemoglu and Restrepo (2017).
[xxix] See, for example Haldane (2018), Ramsden (2018), and Tenreyro (2018).
[xxx] Across 16 major industry groups, the correlation between the change in productivity growth and population ageing averages zero. In regions with above-average ageing in employment and population, manufacturing productivity slowed more than average, while productivity in construction and financial services slowed less than average. Results are also inconclusive using the 30-49 employment share, the 60+ population share and 70+ population share.
[xxxi] This is consistent with OECD research, see Paccagnella (2016). Median pay among people with tertiary education is about 70% above that for people of similar age who lack tertiary education. Skirbekk (2003) argues that pay data may not fully reflect the age-related deterioration in productivity.
[xxxii] On average in 2014-18, graduates aged 50-59 years were paid 15% more than graduates aged 30-39 years and 2% more than graduates aged 40-49 years. Among non-graduates, the 50-59 age group on average were paid 6% more than the 30-39 year age group and 1% less than the 40-49 year age group.
[xxxiii] It is possible that there is some selection bias here, in that people that experience a very large age-related decline in productivity levels may be unable to find any job and hence will not be in work. This effect is likely to be limited for people aged 50-59 years – for whom employment rates are not very different to the 40-49 age group (allowing for education) -- but may be more marked for people above 60 years (for whom employment rates are much lower), and may account for the lower participation rates among this age group.
[xxxiv] See Caselli (2015) for a similar discussion.
[xxxv] See Goodhart and Pradhan (2017).
[xxxvi] See box on pages 39-43 of the August 2018 Inflation Report. See also Vlieghe (2016), Carvalho *et al* (2016), Ferrero *et al* (2017), Lisack *et al* (2017), Nerlich and Schroth (2018), and Sudo and Takizuka (2018).
[xxxvii] Lisack *et al* (2017) show that this lifecycle savings pattern also holds in the US data. See also Cowell *et al* (2016).
[xxxviii] See Hughson *et al* (2016) and Wong (2018). The effects of a 1pp change in mortgage rates on mortgage payments are smaller for people with a repayment mortgage rather than an interest-only mortgage. We allow for this, using the NMG survey results that include mortgage type.
[xxxix] See Bunn *et al* (2018).
[xl] The share of total household wealth that is held by people aged 65+ years has risen from 28% in 2006-08 to 37% in 2014-16, while the share held by people aged 16-44 years has fallen from 21% to 14%. The share of houses that are owned by people aged 55+ years has risen from 39% in 1991 to 42% in 2001 and 55% in 2016.
[xli] Splitting consumer spending by the age of the head of household.
[xlii] Since 2008, the share of all households with a mortgage has fallen from 36% to 28%, a drop of 8pp. The decline is 13pp (from 51% to 38%) among households aged below 45 years, and 2pp (from 15% to 13%) among households aged over 55 years.
[xliii] In 2016/17, 34.1% of households in England owned their home with no mortgage (up from 31.4% in 2008-08), while 28.4% owned their home with a mortgage (down from 36.5% in 2008-09). Source: English Housing Survey.
[xliv] See Imam (2013).
[xlv] See Cloyne *et al* (2016).
[xlvi] For example, the NMG survey results suggest that, combining the effects on all households, the total impact on household cashflow from a 1pp rise in all interest rates has risen from 0.36% in 2016H1 to 0.44% in 2017H2 and 0.51% in 2018H1.
[xlvii] It is hard to establish this definitively either way. Estimates of wealth effects on spending vary significantly.
[xlviii] For example through a rapid shrinkage in high productivity sectors with heavy exposure to EU trade, migration flows and disruption to transport.