Office for National Statistics

Article

The employment-population ratio and changes in the UK labour market: 2008 to 2023

Analysing the labour market, focusing on changes in UK employment through the global financial crisis and the coronavirus (COVID-19) pandemic.

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Table of contents

1 . Main points

- The employment-population (EPOP) ratio reflects demographic changes and trends in employment and activity rates, which provides more context for the recent impacts of the coronavirus (COVID-19) pandemic on the UK labour market.
- In the period after the global financial crisis and before the coronavirus pandemic, the EPOP ratio increased to historic highs, driven by higher levels of employment and labour market participation amongst people aged 50 years and over.
- The post-pandemic fall in the activity rate of workers aged 50 to 64 years has reduced the EPOP ratio in recent years, although the EPOP ratio and the activity rate of older workers remain relatively high by historical standards.

2 . The employment-population (EPOP) ratio and its value in labour market analysis

Recent developments in the EPOP ratio

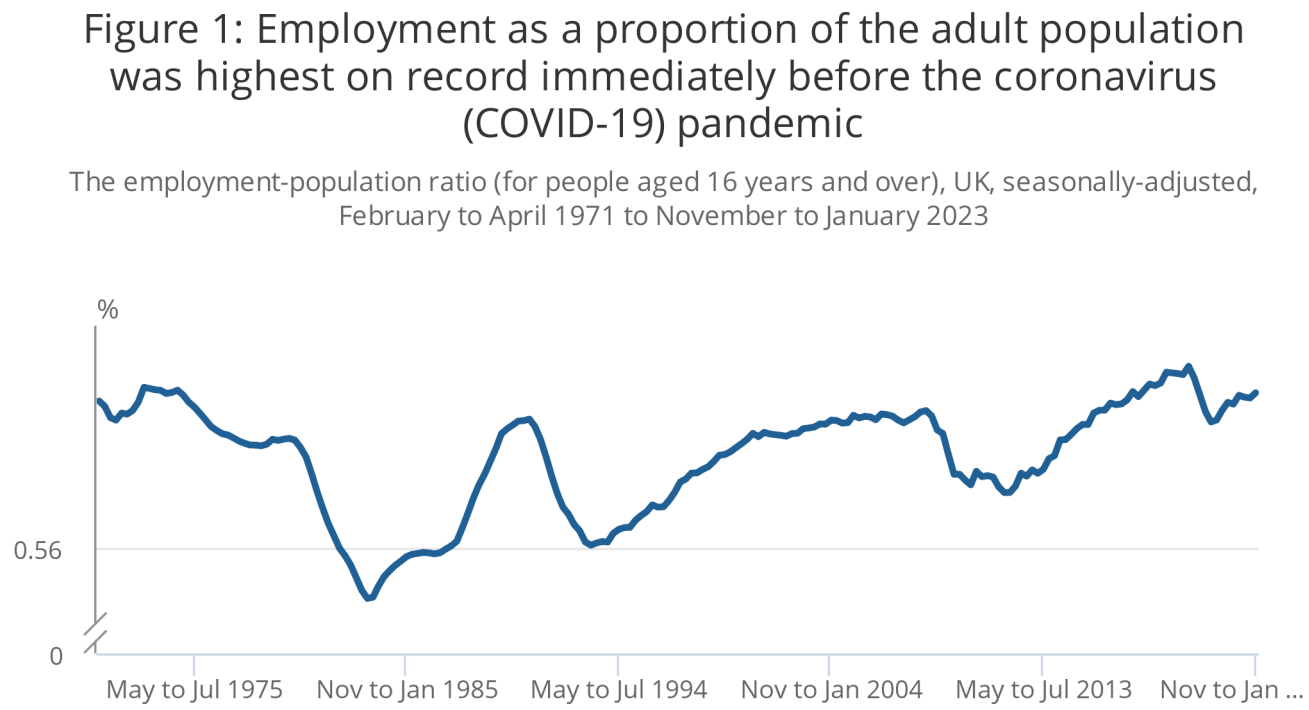
The EPOP ratio is the proportion of the adult population (POP), people aged 16 years and over, who are in employment (E) at any given time (t). It is an indicator of how well the economy is doing in creating jobs, relative to the total number of adults.

$$EPOP_t = \frac{E_t}{POP_t}$$

Figure 1 shows how the EPOP ratio in the UK has changed over the last five decades. There is a clear cyclical pattern, with the EPOP ratio falling significantly during recessions as employment falls, but then returning to a longer-term ratio of around 0.6.

Figure 1: Employment as a proportion of the adult population was highest on record immediately before the coronavirus (COVID-19) pandemic

The employment-population ratio (for people aged 16 years and over), UK, seasonally-adjusted, February to April 1971 to November to January 2023



Source: Labour Force Survey from the Office for National Statistics

Notes:

1. The population totals used for the latest Labour Force Survey (LFS) estimates use projected growth rates from Real Time Information (RTI) data for UK, EU, and non-EU populations based on 2021 patterns. The total population used for the LFS, therefore, does not take into account any changes in migration, birth rates, or death rates since June 2021. As such, levels estimates may be under- or over-estimating the true values and should be used with caution. Estimates of rates will, however, be more robust.

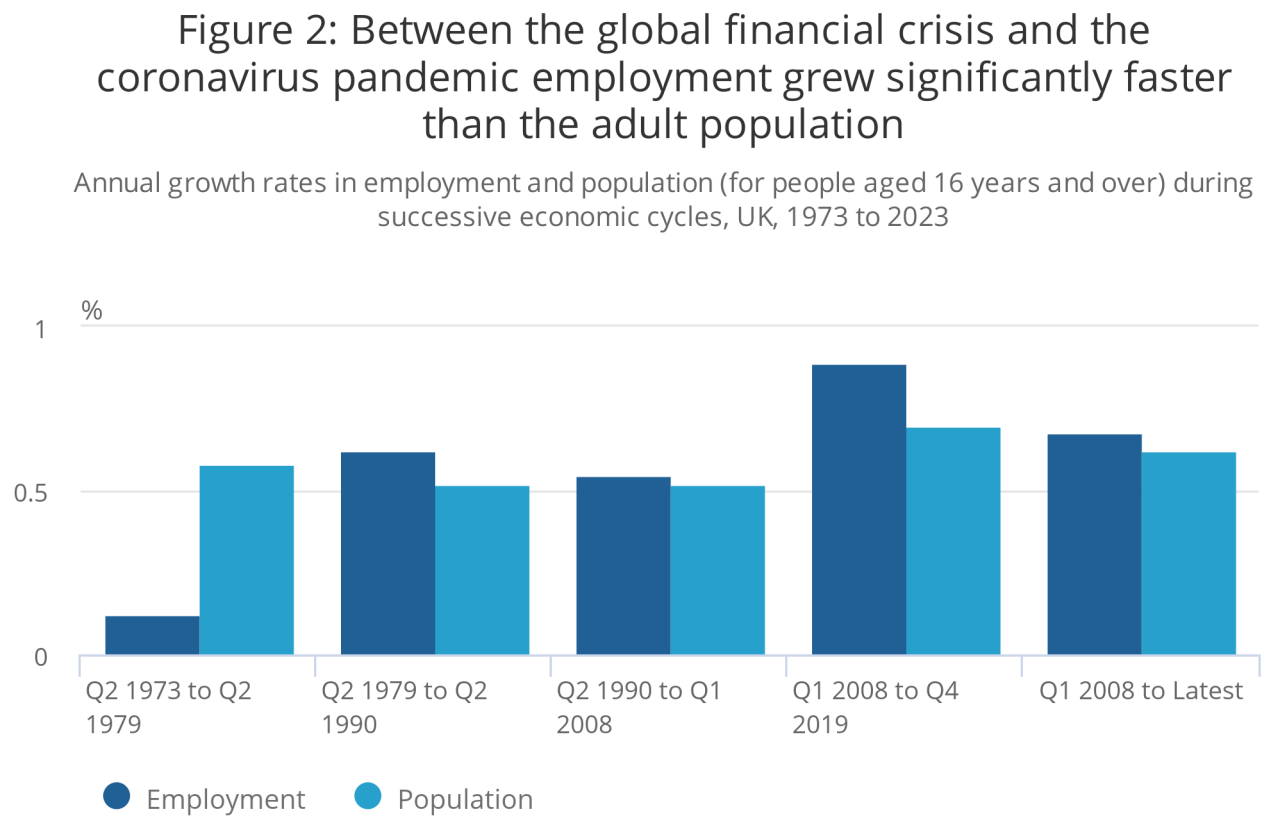
The period following the global financial crisis in 2008 and 2009 and leading up to the coronavirus pandemic in 2020 saw a particularly strong recovery in the EPOP ratio, driven by rapid growth in employment. This was despite several major headwinds that otherwise would be expected to lower the EPOP ratio, including:

- a large rise in inactivity among younger people, associated with greater participation in education
- population ageing resulting in a higher share of the adult population in age categories where labour market activity is lower
- a period of historically low productivity growth where the sharp slowdown in productivity growth relative to the pre-global financial crisis trend, commonly described as the productivity puzzle (for more information, see our What is the productivity puzzle? article)
- a fall in the public sector headcount of over 1 million between 2009 and 2018
- an acceleration in the adult population growth rate, meaning employment also had to grow at a faster rate to maintain the existing EPOP ratio

Figure 2 compares the respective annual rates of change in employment and the adult population across the cyclical peaks in the UK economy. This shows that during the period between the global financial crisis and the onset of the coronavirus pandemic (between the cyclical peaks in Quarter 1 (Jan to Mar) 2008 and Quarter 4 (Oct to Dec) 2019), annual growth in both employment and the adult population accelerated, relative to previous cycles. The annual change in employment was particularly high, resulting in the EPOP ratio rising to its highest recorded level prior to the introduction of coronavirus-related restrictions in March 2020.

Figure 2: Between the global financial crisis and the coronavirus pandemic employment grew significantly faster than the adult population

Annual growth rates in employment and population (for people aged 16 years and over) during successive economic cycles, UK, 1973 to 2023



Source: Labour market overview, UK from the Office for National Statistics

Notes:

1. Cyclical peaks are determined by levels of quarterly real gross domestic product (GDP).
2. The latest data is for the three-month period November 2022 to January 2023.

Employment fell during the pandemic, although the extent was limited by government-funded job support schemes. As coronavirus restrictions have been lifted, the level of employment has recovered. Despite unemployment falling to its lowest rate since the early 1970s, the EPOP ratio remains lower than the peak before the pandemic. This has been largely attributed to a fall in labour supply and increase in inactivity, as established in our Alternative measures of underutilization in the UK labour market article.

Figure 1 shows that the latest EPOP ratio, pertaining to the three-month period November 2022 to January 2023, is still relatively high compared to historic levels. Figure 2 shows that, even considering the fall in employment since the pandemic, average annual employment growth since Quarter 1 2008 has still been stronger than over the previous three economic cycles.

Using the EPOP ratio in labour market analysis

For most countries, the unemployment rate is the headline labour market statistic, but the EPOP ratio provides several advantages for labour market analysis because it encapsulates both changes in employment rates and activity rates. These advantages are explained in The employment-population ratio: its value in labor force analysis (PDF, 1.5MB). This is particularly relevant in providing context around the recent impacts of the pandemic on employment and inactivity in the UK. The EPOP ratio is better equipped to highlight long-term secular changes in employment patterns, including those caused by demographic changes.

For the purposes of looking at changes in the EPOP ratio over time, the employment rate (ER) is defined as the ratio of employment (E) to the active population (A), or simply one minus the official unemployment rate. Note that this definition differs from the headline employment rate formally used by the Office for National Statistics (ONS), which are based on the entire population. The active population consists of people aged 16 years and over who are either employed or unemployed.

$$ER_t = \frac{E_t}{A_t}$$

The activity rate (AR), which is also commonly referred to as the participation rate, is the proportion of the adult population (POP) that is active (A).

$$AR_t = \frac{A_t}{POP_t}$$

Therefore, the EPOP ratio is the product of these employment and activity rates.

$$EPOP_t = \frac{E_t}{A_t} \times \frac{A_t}{POP_t} = ER_t \times AR_t$$

Figure 3 shows the employment rate for the active UK adult population. There have been strong cyclical movements in the employment rate over the last five decades, and currently the employment rate for the adult population is at its highest since the early 1970s.

Figure 3: Employment for people active and aged 16 years and over remains close to its highest recorded rate

Employment rate (of people aged 16 years and over), seasonally adjusted, UK, February to April 1971 to November to January 2023

Source: Labour market overview, UK from the Office for National Statistics

Notes:

1. The headline employment rate published by the ONS is slightly different to that shown in this chart, as it relates to the total population in people aged 16 to 64 years.

2. ONS headline measure of unemployment is based on all people aged 16 years and over. Therefore, the employment rate in this chart is one minus the headline unemployment rate.

Figure 4 shows the activity rate for the UK adult population, and it is clear this has fallen since the start of the coronavirus pandemic. This has been highlighted in our Sickness absence in the UK labour market: 2021 article, which reports increased rates of long-term sickness absences. Moreover, our Movements out of work for those aged over 50 years since the start of the coronavirus pandemic article showed a greater propensity for older workers to leave the labour market.

However, these recent changes have offset rising activity rates in the decade leading up to the pandemic, so the current activity rate is not markedly different from its past average. This is despite significant population ageing effects and higher participation in education. Therefore, our Worker movements and economic inactivity in the UK article shows that analysis examining the rise in inactivity during the pandemic should acknowledge the relatively high activity rates recorded immediately prior to the pandemic.

Figure 4: Labour force activity has fallen since the start of the coronavirus pandemic

Activity rate (for people aged 16 years and over), UK, seasonally adjusted, February to April 1971 to November January 2023

Source: Labour market overview, UK from the Office for National Statistics

3 . Accounting for changes in the employment-population (EPOP) ratio since the global financial crisis and coronavirus (COVID-19) pandemic

In this section, we decompose changes in the EPOP ratio into the relative contributions of 10 different demographic groups. These are, for men and women, the following five age categories:

- 16 to 24 years
- 25 to 34 years
- 35 to 49 years
- 50 to 64 years
- 65 years and over

The aggregate EPOP ratio is the weighted average of the EPOP ratio for each demographic group, where each is weighted by the respective population share (SPOP).

$$EPOP_t = \sum_{i=1}^{10} (SPOP_{i,t} \times EPOP_{i,t})$$

The EPOP ratio for each demographic group can also be represented as the product of respective employment and activity rates, as defined in the Section 2: the employment-population (EPOP) ratio and its value in labour market analysis:

$$EPOP_t = \sum_{i=1}^{10} (SPOP_{i,t} \times ER_{i,t} \times AR_{i,t})$$

Therefore, the change in the aggregate EPOP ratio between two time periods (t) and (t minus 1) reflects changes in the EPOP ratio within each demographic group, in turn reflecting changes in employment and activity rates. Moreover, it shows changes in the share of the population, accounted for by each demographic group.

The change in the EPOP ratio between two periods can be broken down into a total of 30 demographic contributions. That is for each of the 10 demographic groups: the change in population share, the change in the employment rate, and the change in the activity rate. The impact of these changes for each demographic group on the total change in the EPOP ratio is scaled by the other components, so the sum of the 30 contributions adds up accordingly.

The scaled contributions for each demographic group to the total change in EPOP between two periods t and t minus 1 is then:

- change in the activity rate

$$(SPOP_{i,t} \times ER_{i,t})(AR_{i,t} - AR_{i,t-1})$$

- change in the employment rate

$$(SPOP_{i,t} \times AR_{i,t-1})(ER_{i,t} - ER_{i,t-1})$$

- change in the population share

$$(AR_{i,t-1} \times ER_{i,t-1})(SPOP_{i,t} - SPOP_{i,t-1})$$

The focus of this article is on how these aspects of the UK labour market have changed since the beginning of 2008, a period encapsulating both the global financial crisis and the coronavirus pandemic.

Figure 5 shows the contributions to the change in the EPOP ratio between the three-month periods January to March 2008 and the latest period for which data has been published, November 2022 to January 2023. Over this period, the EPOP ratio increased from 0.603 to 0.609.

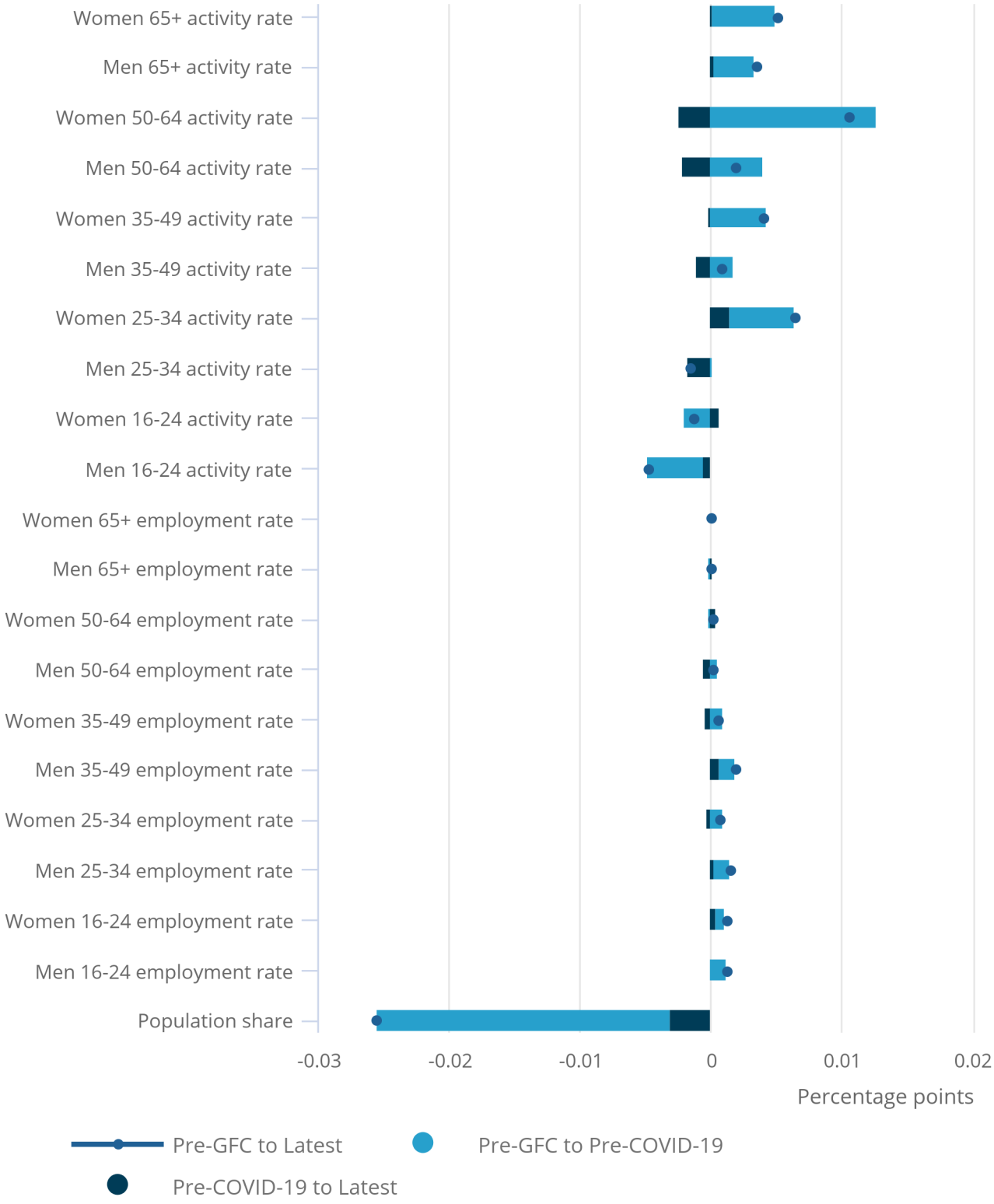
This change in the EPOP ratio has also been separated into the change over two sub-periods of particular interest. The first period is January to March 2008 to October to December 2019 (pre-GFC to pre-pandemic), when the EPOP ratio increased significantly from 0.603 to 0.617. The second period is October to December 2019 to November 2022 to January 2023 (pre-pandemic to latest), when the EPOP ratio fell back from 0.617 to 0.609.

Figure 5: Higher female activity rates in older age categories have been the main factor in offsetting the impact of population ageing on the EPOP ratio

Contributions to the change in EPOP ratio, UK, January to March 2008 to November to January 2023

Figure 5: Higher female activity rates in older age categories have been the main factor in offsetting the impact of population ageing on the EPOP ratio

Contributions to the change in EPOP ratio, UK, January to March 2008 to November to January 2023



Source: Labour Force Survey from the Office for National Statistics

Notes:

1. The components in this chart add up to the total change in the EPOP ratio in each period. Between January to March 2008 and November to January 2023, EPOP increased by 0.006. Between January to March 2008 and October to December 2019, EPOP increased by 0.014. Between October to December 2019 and November to January 2023, EPOP fell by 0.008.

2. Population share is the sum of the changes in population share effects over the 10 demographic groups.

In Figure 5, the respective contributions of the population share effects have been added up across the 10 demographic groups. Over the entire period, the impact of changes in the population structure was sufficient to reduce the EPOP ratio by 0.026. This reflects the increasing population shares of older age groups, where activity rates are lower.

This demonstrates that population ageing has, and continues to be, a significant headwind on the EPOP ratio. Figure 1 indicates that if all other changes to the EPOP ratio were ignored, this effect would have permanently reduced the present EPOP ratio by more than the fall in employment that occurred during the global financial crisis. However, there were other changes in the labour market over these years that offset this demographic effect.

Over the entire period, the overall contribution of changing employment rates across the demographic groups has been small but positive, especially within the younger age groups. The current employment (unemployment) rate for people aged 16 years and over is marginally higher (lower) than before the onset of the global financial crisis.

The contributions of changes in activity rates are particularly interesting, especially in the context of recent focus on higher inactivity among older workers since the pandemic.

Lower activity rates for people aged 25 years and under have negatively contributed to the EPOP ratio, reflecting greater participation in further and higher education. This has been offset by higher activity rates within older age groups, especially for women.

This increase in female participation, reflecting the increase in female State Pension Age, makes a significantly positive contribution to the rising EPOP ratio over this period. Another relevant factor may have been the change in eligibility criteria for the age of the youngest child in qualifying for Lone Parent Income Support. Changes in before- and after-school support may have also contributed to higher participation in the female 25 to 49 years age group.

Increases in activity rates among older people were particularly marked in the period between the global financial crisis and the pandemic and were sufficient to more than offset the negative population share effect on the EPOP ratio. In the period following the pandemic, activity rates have fallen in most male age groups and particularly within the 50 to 64 years age group for both men and women. This, along with further population ageing effects, has contributed to the post-pandemic fall in the EPOP ratio and is consistent with our Reasons for workers aged over 50 years leaving employment since the start of the coronavirus pandemic article.

However, Figure 5 makes clear that lower activity rates since the pandemic have not offset the increases in activity observed in the previous decade. This is particularly evident for older female age groups.

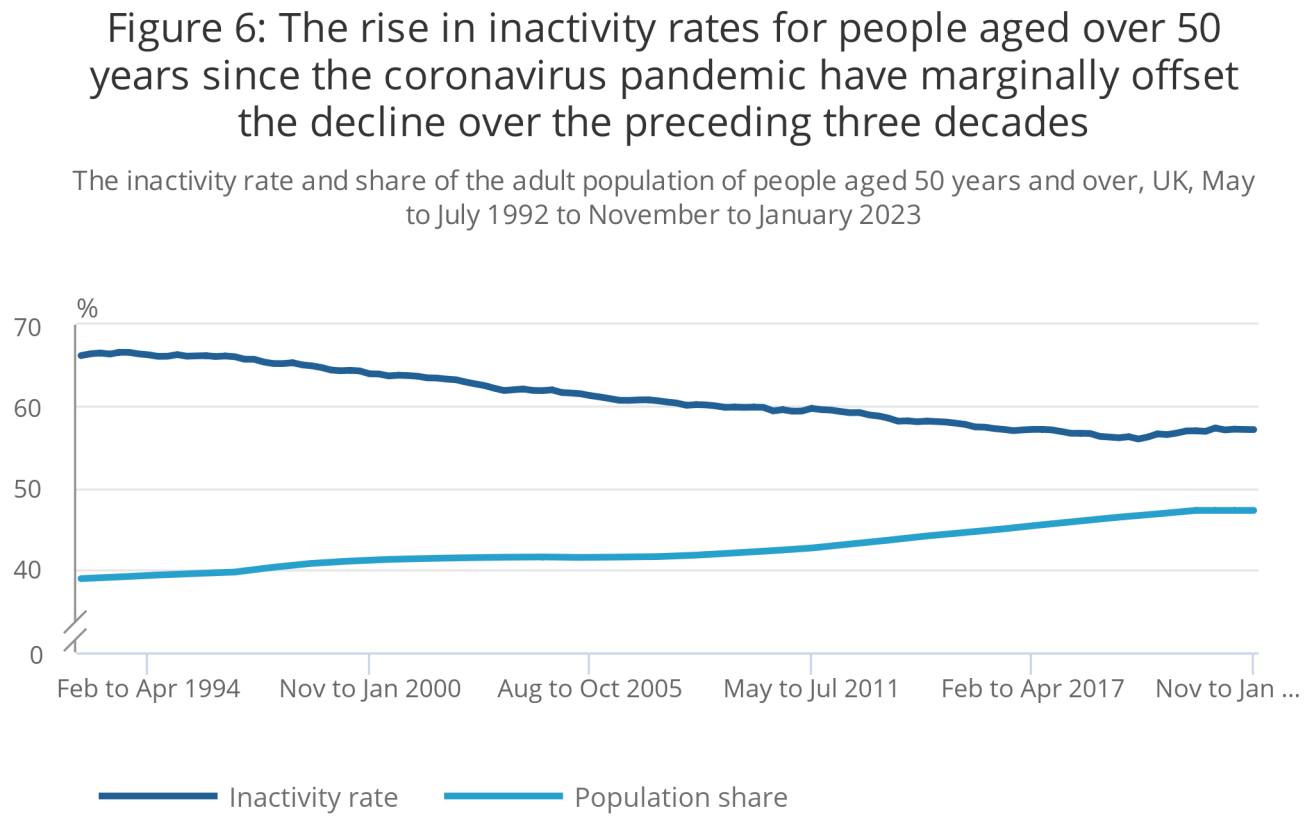
Recent Analysis by the Institute for Fiscal Studies on the rise in economic inactivity among people in their 50s and 60s (PDF, 531KB) noted that:

- the rise in inactivity among people aged 50 years and over during the pandemic followed many years of decline, and 2021 was the first year that the state pension age wasn't rising; rising state pension age may have been an important factor driving higher activity rates among older women in the labour force
- there does not appear to be a link between movements into inactivity and occupations negatively affected by the pandemic, making the rise in inactivity to be less likely the outcome of demand weakness
- there is little evidence that growing inactivity among older workers was the outcome of poor health, the proportion of which in inactivity remaining constant
- it appears that the increase in inactivity reflects a lifestyle choice, considering new circumstances, with retirement looking more attractive after the pandemic

The rise in inactivity among people aged 50 years and over since the pandemic should be considered in context of general population ageing and the sustained fall in inactivity rates in the preceding three decades. See Figure 6 for more information. Between October to December 2019 and November to January 2023, the total number inactive aged 50 years and over increased by 579,630. However, the total population of people aged 50 years and over increased by 598,499 over the same period. Therefore, if the activity rate had remained unchanged at the October to December 2019 rate of 56.1%, then inactivity numbers for the people aged over 50 years would have increased by 334,323. The smaller proportion of 245,307 reflects the increase in inactivity rate to 57.1%.

Figure 6: The rise in inactivity rates for people aged over 50 years since the coronavirus pandemic have marginally offset the decline over the preceding three decades

The inactivity rate and share of the adult population of people aged 50 years and over, UK, May to July 1992 to November to January 2023



Source: Labour Force Survey from the Office for National Statistics

Figure 6 shows that, although the coronavirus pandemic has halted the long-term decline in inactivity among older people, currently prevailing rates are still historically low. However, it is too early to conclude whether the recently observed uptick in the inactivity rate for people aged 50 and over is a temporary or permanent phenomenon.

However, the second wave of the Over 50s Lifestyle Study, discussed in our Reasons for workers aged over 50 years leaving employment since the start of the coronavirus pandemic article surveys the motivations of people aged 50 to 65 years who left work during the coronavirus pandemic. Responses included why they left and whether they intend to return. The main findings were:

- the majority of those who left or lost their jobs since the start of the coronavirus pandemic owned their homes and were more likely to be debt free
- people aged 50 to 54 years were significantly less likely to be debt free, compared with those aged 60 to 65 years; more than half of people aged 60 to 65 years were confident or very confident that their retirement provisions would meet their needs, compared with just over one-third of people aged 50 to 54 years
- age was also a factor when considering whether to return to work; 86% for people aged 50 to 54 years and 44% for people aged 60 to 65 years
- among those who would consider returning to work, the most important factors when choosing a paid job were flexible working hours and good pay
- around one in five said they were currently on an NHS waiting list for medical treatment, but this rose to one in three for those who left their previous job for a health-related condition

4 . Employment-population ratio data

Labour market overview
Dataset | Released 14 March 2023
Estimates of employment, unemployment, economic inactivity and other employment-related statistics for the UK.

5 . Glossary

Employment

Employment measures the number of people in paid work or who had a job that they were temporarily away from (for example, because they were on holiday or off sick).

Unemployment

Unemployment measures people without a job who have been actively seeking work within the last four weeks and are available to start work within the next two weeks.

Inactivity

People not in the labour force (also known as economically inactive) are not in employment but do not meet the internationally accepted definition of unemployment. This is either because they have not been seeking work within the last four weeks or they are unable to start work in the next two weeks.

Activity

People aged 16 years and over who are either in employment or unemployed. The labour force refers to all economically active individuals.

6 . Data sources and quality

For data sources and quality information, please see Sections 6 and 7 of our Labour market overview, UK: March 2023 bulletin.

7 . Related links

Alternative measures of underutilisation in the UK labour market
Article | Released 5 September 2022
Considering broader measures of labour market availability – or underutilisation of the labour market – and indicators of mismatch between unemployment and vacancies across industries.

Sickness absence in the UK labour market: 2021
Article | Released 29 April 2022
Sickness absence rates of workers in the UK labour market, including number of days lost and reasons for absence.

Movements out of work for those aged over 50 years since the start of the coronavirus pandemic
Article | Released 14 March 2022
The movement of people in the UK aged 50 to 70 years leaving the labour market during the coronavirus (COVID-19) pandemic and how this has changed for different sectors and demographic groups. Data from the Labour Force Survey.

Worker movements and economic inactivity in the UK: 2018 to 2022
Article | Released 19 December 2022
Commentary on UK worker movements and increased inactivity during the coronavirus (COVID-19) pandemic compared with other countries.

Reasons for workers aged over 50 years leaving employment since the start of the coronavirus pandemic: wave 2
Article | Released 27 September 2022
Motivations of those aged 50 to 65 years leaving work during the coronavirus (COVID-19) pandemic in Great Britain from March 2020, why they left and whether or not they intend to return. Main findings from wave 2 of the Over 50s Lifestyle Study.

8 . Cite this article

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