Office for National Statistics

Article

Trends in UK real GDP per head: 2022 to 2024

Analysis of trends in real gross domestic product (GDP) per head using national accounts, employment, and population statistics.

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Table of contents

1 . Main points

- The rate of increase in real gross domestic product (GDP) per head has slowed in recent years as the population has increased at a faster rate than the volume of output produced.
- In Quarter 2 (Apr to June) 2024, real GDP per head was 0.6% below its pre-coronavirus (COVID-19) pandemic level, while total real GDP was 2.9% above its pre-pandemic levels.
- The UK population is estimated to have increased by an average of 1% per year in 2022 and 2023, which reflected higher immigration from non-EU nationals; this was the fastest pace of UK population growth in over 75 years.
- The decline in real GDP per head in 2023 was mostly caused by a slower pace of hourly productivity and lower average hours worked.
- We plan to carry out a further interim reweighting of the Labour Force Survey (LFS), to be published in December 2024, which will be based on the interim national population projections (2021-based), published in January 2024.

2 . GDP and population growth rates

Gross domestic product (GDP) is a measure of the total output produced in a particular country, while GDP per head is considered one indicator of economic welfare. This is explored in our Gross domestic product and economic welfare, UK: 1987 to 2022 article. This is because the volume of goods and services available to the average person is a proxy for a country's living standards. Table 1 provides some historical context around changes in economic prosperity. There has been a decrease in GDP growth rates per head in the 21st century, particularly in recent years.

Table 1: There has been a decrease in growth rates of real GDP per head in recent years
Average of yearly growth rates in UK gross domestic product (GDP) and UK population by decade

%	Real GDP	Population	GDP per head
1970s	2.7	0.1	2.5
1980s	2.6	0.1	2.5
1990s	2.1	0.3	1.9
2000s	1.7	0.6	1.1
2010s	2.0	0.7	1.3
2020s	1.1	0.7	0.3

Source: Quarterly National Accounts from the Office for National Statistics

Notes

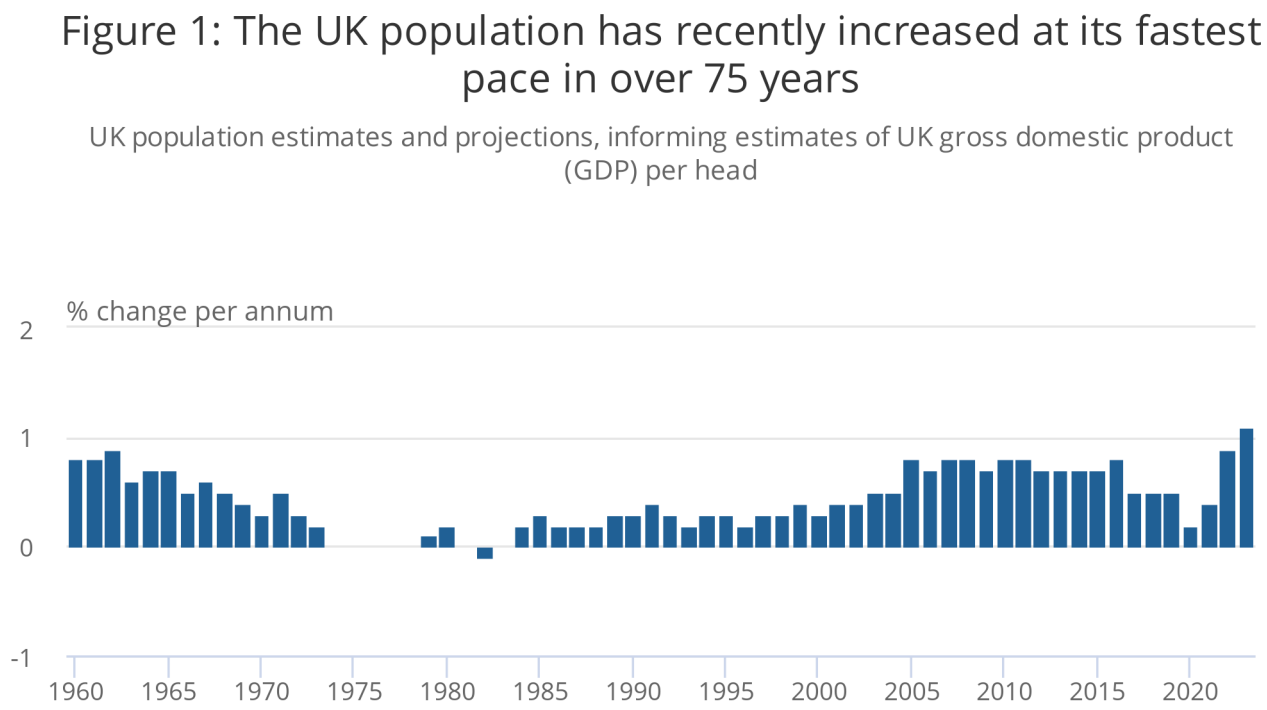
1. 2020s includes the period from Quarter 1 (Jan to Mar) 2020 to Quarter 2 (Apr to Jun) 2024 which are the latest available data at the time of publication.

2. In line with the National Accounts Revisions Policy, 2022 is consistent with mid-year population estimates, as published on 15 July 2024. 2023 is now consistent with 2021-based interim population projections, as published on 30 January 2024.

Population growth has been particularly strong in recent years. The UK population is estimated to have increased by an average of 1% per year in 2022 and 2023 (see Figure 1). This is the fastest population growth rate in over 75 years. During the early 1960s, population growth was partly a result of the baby boom.

Figure 1: The UK population has recently increased at its fastest pace in over 75 years

UK population estimates and projections, informing estimates of UK gross domestic product (GDP) per head



Source: Quarterly National Accounts from the Office for National Statistics

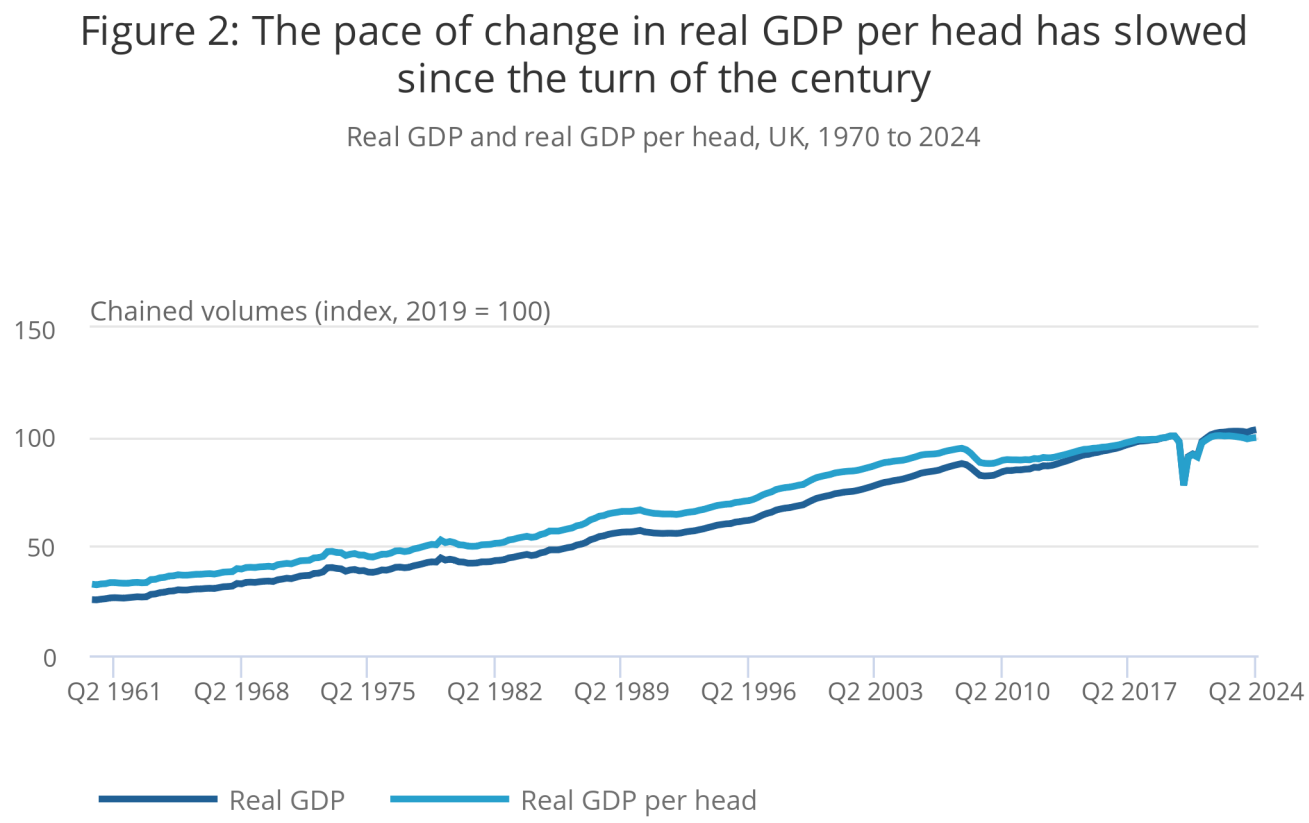
Notes:

1. In line with the National Accounts Revisions Policy, 2022 is consistent with mid-year population estimates, as published on 15 July 2024. 2023 is now consistent with 2021-based interim population projections, as published on 30 January 2024. Population estimates used within estimates of real gross domestic product (GDP) per head have not yet fully incorporated the latest population estimates for the UK.

The latest estimates show that GDP was 2.9% above its pre-coronavirus (COVID-19) pandemic levels in Quarter 2 (Apr to June) 2024. However, GDP per head is still 0.6% below its level from Quarter 4 (Oct to Dec) 2019 (see Figure 2). This article examines changes in labour productivity and average hours per worker during recent years. We also analyse changes in the employment-to-population (EPOP) ratio, including showing how this has responded to recent demographic changes. More information about the EPOP ratio is available in our EPOP ratio and changes in the UK labour market: 2008 to 2023 article.

Figure 2: The pace of change in real GDP per head has slowed since the turn of the century

Real GDP and real GDP per head, UK, 1970 to 2024



Source: Quarterly National Accounts from the Office for National Statistics

Notes:

1. In line with the National Accounts Revisions Policy, 2022 is consistent with mid-year population estimates, as published on 15 July 2024. 2023 is now consistent with 2021-based interim population projections, as published on 30 January 2024.

3 . GDP per head

Changes in real gross domestic product (GDP) per head can be measured using three main factors.

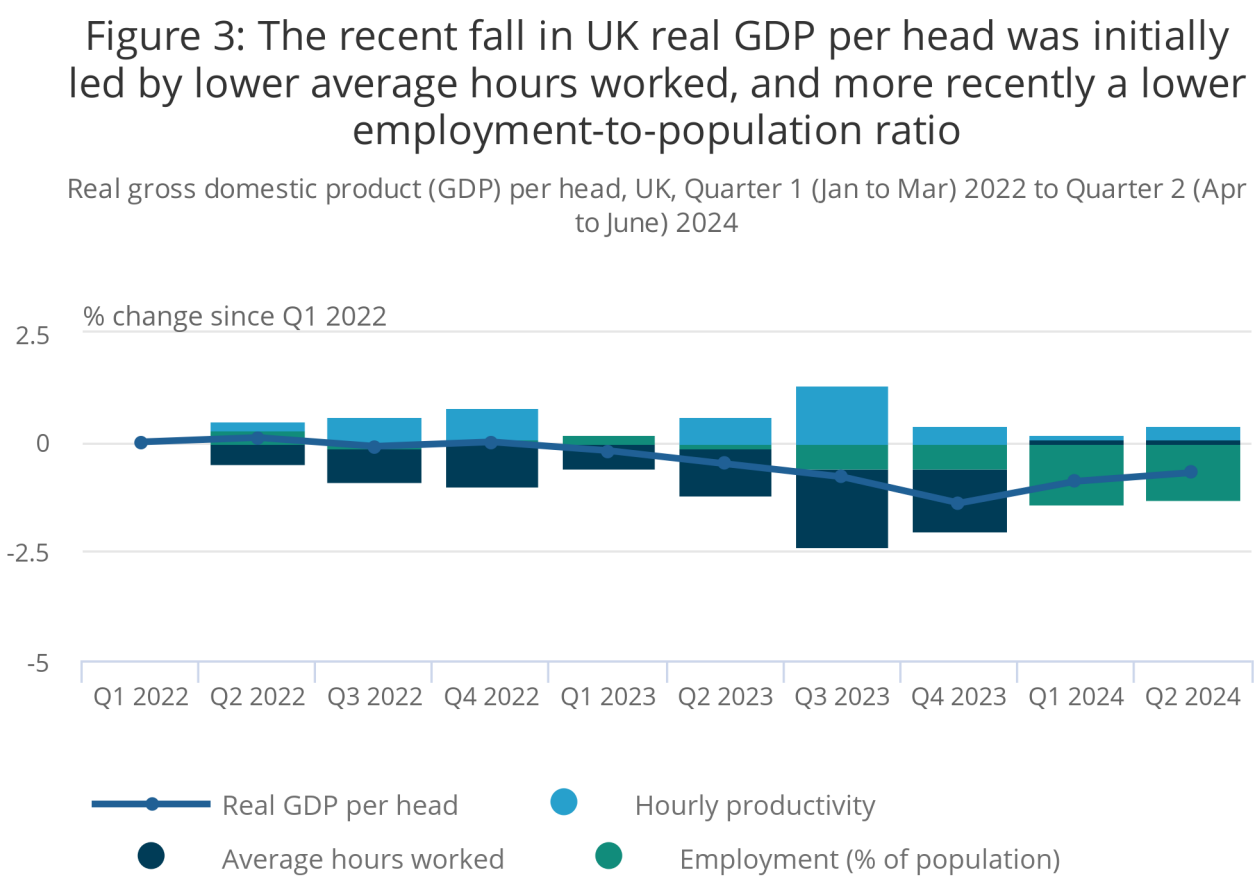
- Hourly productivity, which measures the average economic output produced per hour worked.
- Average hours per worker, which measures the average number of weekly hours worked by each person in employment.
- Employment-to-Population (EPOP) ratio, which measures the share of persons in employment as a percentage of the total resident population.

Figure 3 shows the latest estimates of the cumulative change in real GDP per head since Quarter 1 2022, where there has been a decline over the last two years. This decrease seems to have eased in 2024 as GDP per head increased for two consecutive quarters. However, it is still below its peak level from two years ago. The decline in real GDP per head can mostly be attributed to a slower pace of hourly productivity and lower average hours worked. This may suggest that, in response to recruitment difficulties in recent years, firms were more inclined to retain labour than previously.

Average hours worked recovered somewhat in 2024, while hourly productivity remains below its pre-coronavirus (COVID-19) pandemic trend. The impact of this increase in average hours worked on real GDP per head was partly offset by a fall in the employment-to-population (EPOP) ratio since the second half of last year, where there is some evidence of a cooling in the labour market. Long-term sickness, ageing of the resident population and net migration for reasons other than work each may have been factors that contributed to a higher population outside of the labour force.

Figure 3: The recent fall in UK real GDP per head was initially led by lower average hours worked, and more recently a lower employment-to-population ratio

Real gross domestic product (GDP) per head, UK, Quarter 1 (Jan to Mar) 2022 to Quarter 2 (Apr to June) 2024



Source: Quarterly National Accounts and Labour Force Survey from the Office for National Statistics

Notes:

1. Cumulative percentage changes and contributions are approximated using log-differences.

2. In line with the National Accounts Revisions Policy, 2022 is consistent with mid-year population estimates, as published on 15 July 2024. 2023 is now consistent with 2021-based interim population projections, as published on 30 January 2024.

3. Hourly productivity is proxied using real gross value added (GVA) over totals hours worked. Average hours per worker are proxied using total hours over total employment. There is a small residual between real gross domestic product (GDP) per head and its contributions. This accounts for the difference between real GDP and real GVA.

4. Estimates of total hours have been adjusted to avoid a discontinuity in Quarter 3 (July to Sept) 2022 so that productivity can be assessed without structural breaks. These adjusted productivity hours differ slightly from estimates of hours worked published in our labour market release.

5. Because of increased volatility of Labour Force Survey (LFS) estimates, resulting from smaller achieved sample sizes, these estimates should be treated with additional caution.

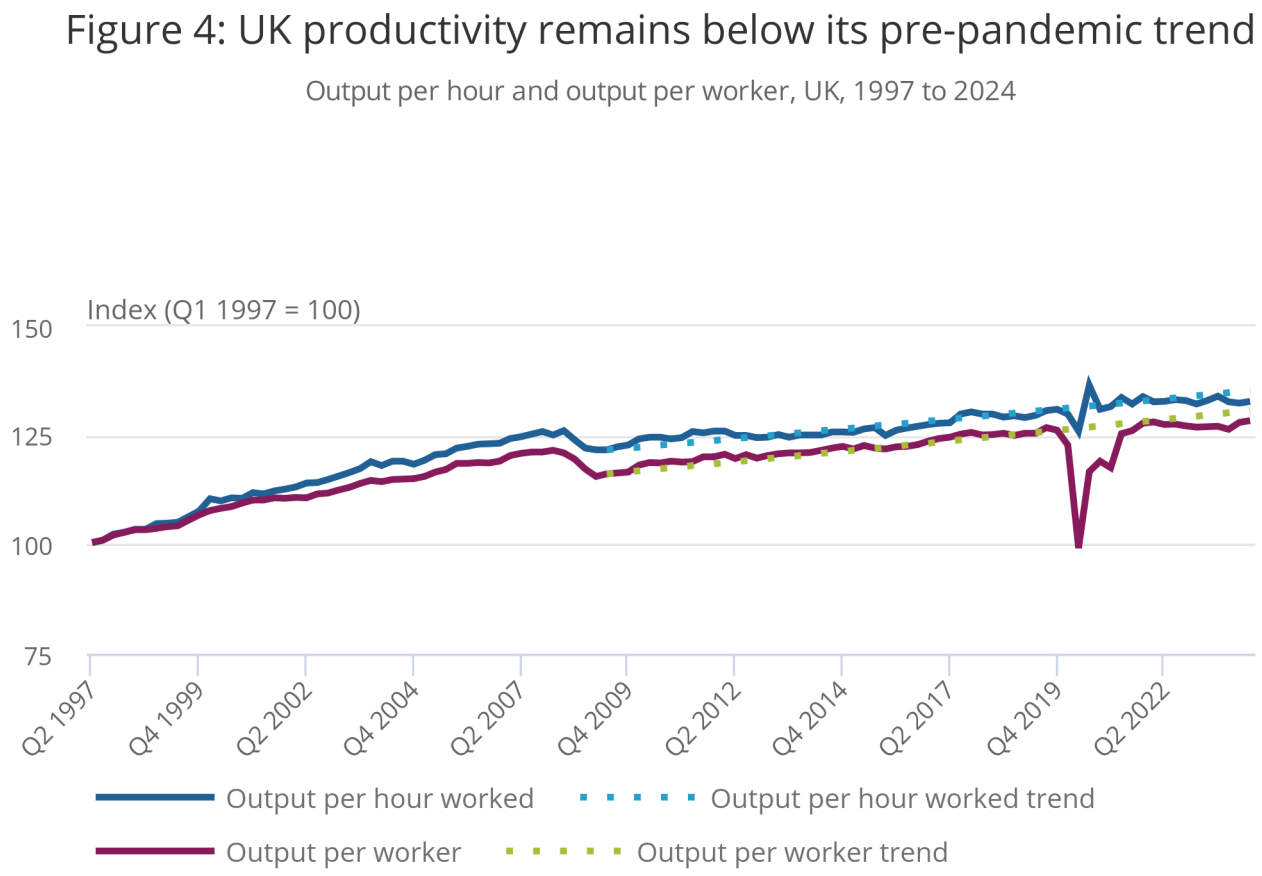
The total employment and total hours worked figures come with some important caveats, because of higher levels of uncertainty in the Labour Force Survey (LFS). The current LFS population levels have also not yet incorporated the latest population projections. A further reweighting of the LFS, to reflect more up-to-date population and migration estimates, is in progress, and is discussed in more detail in our Labour market transformation – update on progress and plans: July 2024 article. This reweighting would include the most recent international migration estimates (more information is available in Section 5). As migration can affect the composition of the labour force and the overall UK population, there may be corresponding impacts on the measure of average hours, total employment, and the EPOP ratio. These newly reweighted LFS estimates are expected to be available by the end of 2024. GDP estimates will also be subject to revision in line with our National Accounts Revisions Policy.

4 . Productivity and the employment-to-population ratio

Productivity is important for economic prosperity, as the only way that an economy can raise its living standards is to produce more with existing or fewer resources. Reduced productivity growth has affected the UK's economic performance since the global financial crisis. The coronavirus (COVID-19) pandemic was followed by a further decrease in productivity. The latest estimates show that output per worker decreased in 2022 and 2023 (Figure 4). There was some increase at the start of 2024 but both hourly productivity and output per worker remain below their pre-pandemic trend rate.

Figure 4: UK productivity remains below its pre-pandemic trend

Output per hour and output per worker, UK, 1997 to 2024



Source: Quarterly National Accounts and Labour Force Survey from the Office for National Statistics

Notes:

1. Hourly productivity is proxied using real gross value added (GVA) over totals hours worked. Output per workeruses real GVA over total persons in employment.

2. Estimates of total hours have been adjusted back to avoid a discontinuity in Quarter 3 (July to Sept) 2022 so that productivity can be assessed without a structural break. These adjusted productivity hours differ slightly from estimates of hours worked, published in our labour market release.

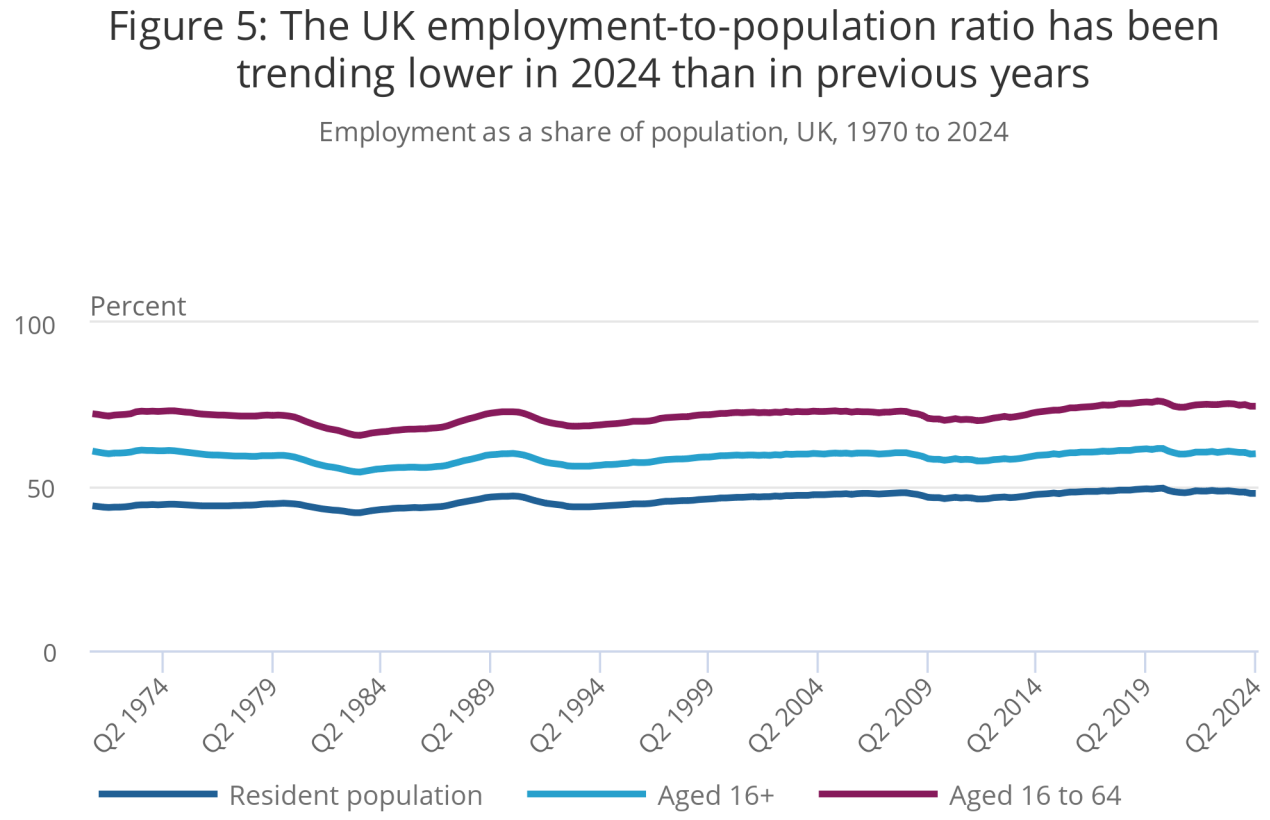
3. For more information on our productivity estimates and methodology, see our Productivity flash estimate and overview: April to June 2024.

4. The latest official estimates of UK productivity do not yet reflect revisions to the national accounts published in September 2024. Updated productivity estimates will be published on 15 November 2024.

The employment-to-population (EPOP) ratio measures the proportion of the UK resident population who are in employment at any given time. This reflects demographic changes that can be identified by changes in employment and activity rates, including population ageing and changes in the level and composition of net migration into the UK. The EPOP ratio decreased from its pre-pandemic peak across measures (Figure 5). Some of this initial decrease was caused by the impact of pandemic lockdowns on employment. More recently, the EPOP ratio has fallen because of a loosening in the labour market in combination with an increase in long-term sickness. Our labour market estimates do not yet fully reflect this increase in the UK population, which will be further incorporated into labour market data as part of our upcoming reweighting of the Labour Force Survey (more information is available in Section 6).

Figure 5: The UK employment-to-population ratio has been trending lower in 2024 than in previous years

Employment as a share of population, UK, 1970 to 2024



Source: Quarterly National Accounts and Labour Force Survey from the Office for National Statistics

Notes:

1. The employment-to-population (EPOP) ratio for the resident population measures persons in employment aged 16 years and over in proportion to the UK population estimates and projections used to inform our measurement of gross domestic product (GDP) per head.

2. In line with the National Accounts Revisions Policy, 2022 is consistent with mid-year population estimates, as published on 15 July 2024. 2023 is now consistent with 2021-based interim population projections, as published on 30 January 2024.

3. The reweighted Labour Force Survey (LFS) estimates incorporate information on the size and composition of the UK population consistent with the population estimates published in November 2023.

4. Because of the increased volatility of LFS estimates, resulting from smaller achieved sample sizes, these estimates should be treated with additional caution.

5. For more information on our labour market estimates, see our Labour market overview.

5 . Migration

The large increase in the UK population over the last two years was mainly caused by net international migration, while the pace of natural change (births minus deaths) has slowed since the coronavirus (COVID-19) pandemic to its slowest rate since the 1970s. The rise in net international migration was led by higher immigration from non-EU nationals, while the number of EU citizens leaving the UK outpaced new arrivals from the EU. This has lead to a net migration outflow of EU citizens. For more information about our estimates of international migration please see our Long-term international migration, provisional: year ending December 2023 bulletin.

The impact of net international migration on the employment-to-population (EPOP) ratio depends on the employment prospects of new arrivals. While some individuals may face initial employment restrictions and would therefore be expected to affect the overall EPOP ratio at first, evidence suggests that migrants have been increasingly successful in joining the workforce.

Recent analysis of HM Revenue and Customs Pay as you Earn (PAYE) data by the Migration Observatory and our Employment, unemployment and economic inactivity by nationality and country of birth dataset both suggest that the overall EPOP ratio may have declined more in recent years, without this net migration. However, we recognise that there are uncertainties in tracking the employment status of all migrants, especially given the size and the changing composition of net migration over the last two years.

Our provisional Long-term international migration estimates bulletin reported cumulative net migration of almost 1.7 million from non-EU countries across 2022 and 2023, while analysis by the Migration Observatory shows over a million non-EU born people joined the PAYE system for the first time across the same two years (noting that this does not specifically indicate when someone arrived in the UK). Though not a direct measure of the EPOP ratio for this group, these figures do imply a higher EPOP ratio for non-EU arrivals than for the resident population as a whole (Figure 5). As this analysis is restricted to employees only, including those who arrive and become self-employed would likely increase the non-EU born EPOP ratio further.

Furthermore, the Economic and Fiscal outlook report by the Office for Budget Responsibility showed that participation rates for recent migrants have risen, particularly those migrating for study or as dependants of those on other visa types. By supporting the EPOP ratio, continued improvement in employment prospects for non-EU born residents in the UK may further contribute to increasing real GDP per head.

6 . Population estimates and projections in labour market statistics

Labour market estimates are an essential component in understanding the interaction between the economy and the population, as reflected by comparing estimates of changes in GDP and changes in GDP per head. Population estimates and projections are also an essential input into the production of estimates from the Labour Force Survey (LFS). The LFS produces official estimates of employment, unemployment, economic inactivity, and hours worked. The LFS requires weights to ensure that estimates derived from the household survey are representative of the wider population being measured. In any weighting exercise for the LFS, we are interested in the size and composition of the population, where changes to these aspects of the population can have an impact on estimates of the labour market.

At any given point in time, our aim is to weight LFS to the best available population data. The most important input to a reweighting would typically be the latest available subnational population projections, which are typically the last publication in a cycle that starts with the publication of mid-year population estimates. We usually release new mid-year population estimates annually, around one year after the reference period. For instance, in July 2024, we published mid-2023 population estimates for England and Wales, followed by estimates for the UK in October 2024. National population projections follow biennially in the autumn, and then consistent subnational population projections are published in the following spring.

This two-yearly cycle for the projections outputs reflects the wide range of data sources spanning the entire life course required to produce our projections. Furthermore, when available, new census data provide numerous new insights, which are important in forming assumptions about future fertility, migration, and mortality for resulting projections. The LFS would typically be reweighted in line with the availability of new subnational population projections.

However, over the last four years, the timing of our population projections releases has changed in response to user feedback and the availability of new population and migration data. This has reflected the atypical demographic changes over this period. We ran a user engagement exercise across our projections releases, at the end of 2020, to determine the release of the next suite of projections and user preferences about the inclusion of Census 2021 data. Feedback through the engagement exercise led to our decision not to develop or release subnational population projections or household projections until Census 2021 data could be incorporated, particularly when using detailed geographies like local authorities. However, this has also had an impact on our ability to reweight the LFS in recent years.

Following Census 2021 for England and Wales, we completed:

- an exercise to reconcile previous population estimates with the new information from the census, explained in our Reconciliation of mid-year population estimates with Census 2021, England and Wales article
- an exercise to produce rebased population estimates from 2012 to 2021, consistent with the Census, explained in our Rebasing of mid-year population estimates following Census 2021, England and Wales bulletin

Both activities were also completed after the 2011 Census. The rebased population data provides an important set of inputs for national, subnational projections, which are used in our economic statistics. This included our National population projections: 2021-based interim, and our upcoming National population projections: 2022-based, where all new demographic assumptions are being developed from the rebased data.

However, since then, user requests in several national-level policy areas highlighted a need for additional national population projections. Therefore, to meet those needs, we also published:

- our National population projections: 2020-based interim in January 2022
- our 2020-based interim national population projections: year ending June 2022 estimated international migration variant dataset in January 2023
- our National population projections: 2021-based interim bulletin in January 2024.

The interim nature of these releases meant that the focus was on updating assumptions around international migration where estimates during and since the coronavirus pandemic have seen notable changes. Assumptions around fertility, mortality and internal migration remained unchanged from previous iterations. These 2021-based interim national projections incorporated:

- the age and sex distribution from Census 2021 (England, Wales and Northern Ireland)
- updated international migration data for 2012 to 2022
- the latest provisional international migration data to mid-2023
- expert advice following the latest international migration releases leading to a new set of migration assumptions
- births and deaths data to mid-2023

The absence of updated subnational projections in recent years has meant adapting national population projections for use in survey reweighting, for example, in our partial LFS reweighting, published in February. Our recent update on labour market statistics explains that it is our intention to carry out a further interim reweighting of the LFS to be published in December 2024, which will be based on our Interim national population projections (NPPs) (2021-based) published in January 2024. This will incorporate more recent information on international migration flows in and out of the UK into our labour market estimates, including, unemployment, economic inactivity, and hours worked. We will explain the results of these 2021-based interim NPPs on the LFS in due course.

In the next release of 2022-based NPPs, we plan to include a comprehensive UK-rebased population (including rebased population estimates for Scotland, from mid-2011 to mid-2021) and new assumptions based on the components of change in the rebased data. This will also incorporate data from the most recent published estimates of international migration. These projections will then form the base for the 2022-based subnational population projections (SNPPs), published in 2025. We will then carry out a full reweighting of the LFS with results expected within our published labour market statistics towards the end of 2025. We will explain the impact of these new 2022-based NPPs and SNPPs, which will underpin the full reweighting of the LFS, as part of our future publications.

7 . Data sources and quality

Gross domestic product (GDP) per head is calculated by dividing estimates of GDP by estimates of the UK population, including population projections for the most recent periods. This explains why estimates of GDP per head are subject to revisions each time GDP and total population estimates are revised. More information about our revision cycle for GDP, including GDP per head, can be found in our National Accounts Revisions Policy. Population estimates are normally published one year after the reference period, with national projections following in the autumn every other year.

8 . Related links

GDP quarterly national accounts, UK: April to June 2024
Bulletin | Released 30 September 2024
Revised quarterly estimate of gross domestic product (GDP) for the UK. Uses additional data to provide a more precise indication of economic growth than the first estimate.

Population estimates for the UK, England, Wales, Scotland and Northern Ireland: mid-2023
Bulletin | Released 8 October 2024
National mid-year population estimates for the UK and its constituent countries, by age and sex.

National population projections: 2021-based interim
Bulletin | Released 30 January 2024
The potential future population size of the UK. These statistics are widely used in planning, for example, fiscal projections, health, education and pensions.

Long-term international migration, provisional: year ending December 2023
Bulletin | Released 23 May 2024
Estimates of UK international migration. Those for year ending (YE) March, June, September and December 2023 are provisional and will be updated when more complete data become available. Those for YE March and June 2023 have been updated and data for YE September and December 2022 are now complete. These are official statistics in development.

Productivity flash estimate and overview, UK: April to June 2024
Article | Released 15 August 2024
Productivity flash estimates for Quarter 2 (Apr to June) 2024, based on the GDP first quarterly estimate and labour market statistics, and productivity overview for Quarter 1 (Jan to Mar) 2024.

Labour market transformation – update on progress and plans: July 2024
Article | Released 18 July 2024
An update on the Transformed Labour Force Survey (TLFS) and Labour Force Survey (LFS). The TLFS is the long-term solution for collecting labour market data given the context of declining response rates in social surveys, which has been experienced across many countries.

9 . Cite this article

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