Office for National Statistics

Article

Productivity overview, UK: October to December 2021

The main findings from official statistics and analysis of UK productivity, presenting a summary of recent developments.

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1 . Main points

Labour productivity

- Output per hour was 2.6% higher than the average level in 2019, prior to the coronavirus (COVID-19) pandemic, growing by 1.3% in Quarter 4 (Oct to Dec) 2021.
- Output per worker increased by 1.4% in Quarter 4 2021 to rise above 2019 levels for the first time since the coronavirus pandemic began.

Multifactor productivity

- In Quarter 4 2021, multifactor productivity (MFP) was slightly below the 2019 pre-coronavirus pandemic average.
- Gross value added (GVA) grew faster than capital and labour inputs in 2021, resulting in 0.7% annual MFP growth compared with the previous year.

Public service productivity

- Public service productivity continued to rise in Quarter 4 2021; output grew by 2.1%, while growth in inputs was 0.8%.
- The increase in COVID-19 testing and booster vaccinations towards the end of 2021 was a major contributor to public service output.
- Annual public service productivity is estimated to have risen by 9.0% in 2021, following a fall of 13.1% in 2020.

This release covers the latest estimates for Labour, Multifactor and Public Service Productivity.

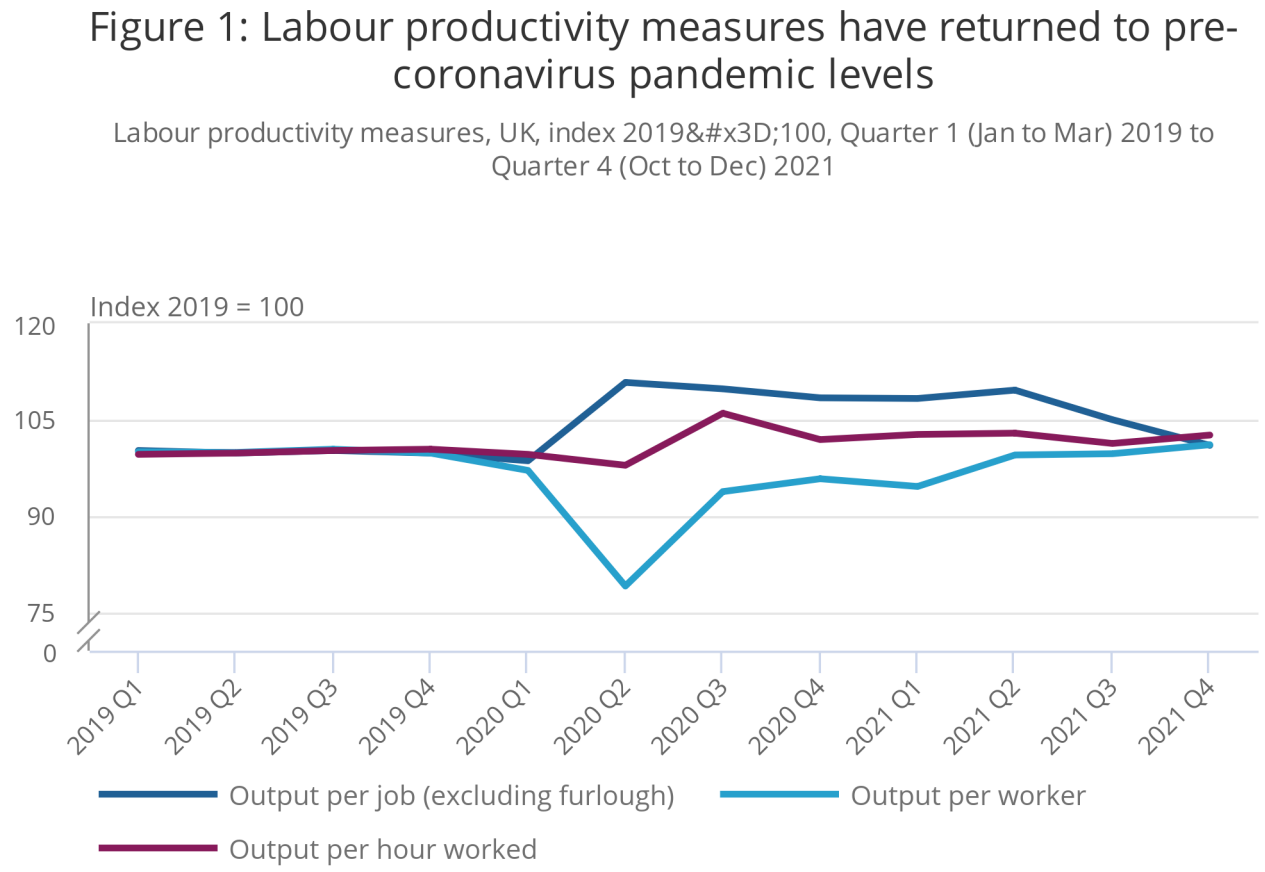
2 . Labour productivity

These are the first estimates of UK labour productivity statistics following the end of the Coronavirus Job Retention Scheme (CJRS), which applied from 1 March 2020 to 30 September 2021.

Output per hour worked, our headline measure, increased by 1.3% in Quarter 4 (Oct to Dec) 2021, while output per job, excluding furloughed workers, declined by 3.8% in the same time period. Productivity, as measured by output per worker, grew for the third consecutive quarter, increasing by 1.4% in the fourth quarter, and was above pre-coronavirus (COVID-19) pandemic levels for the first time since the pandemic began. Output per hour worked was 2.6% above its pre-coronavirus pandemic 2019 average level, and 0.7% higher compared with the same quarter a year ago.

Figure 1: Labour productivity measures have returned to pre-coronavirus pandemic levels

Labour productivity measures, UK, index 2019=100, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2021

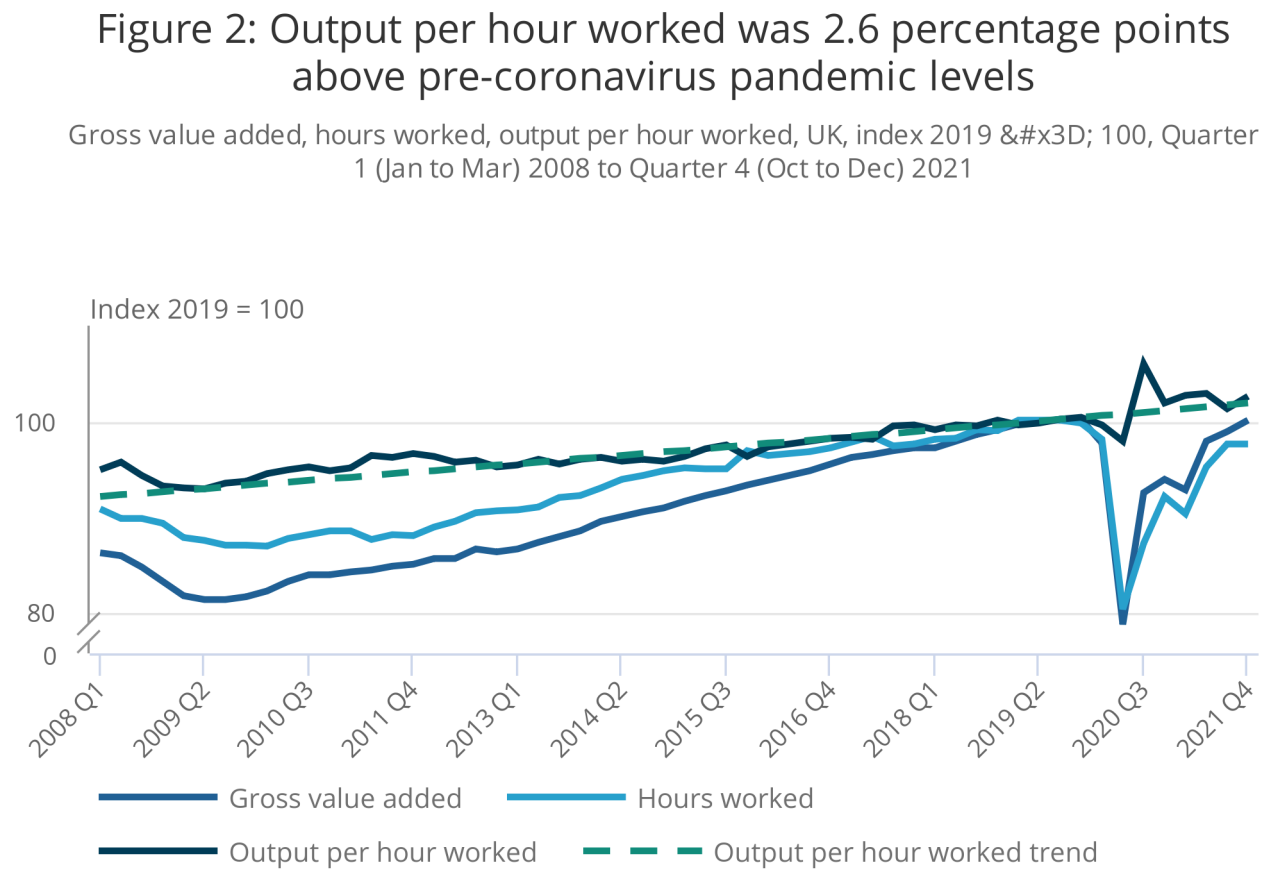


Source: Office for National Statistics – Productivity overview, UK

Figure 2 shows how output per hour worked, gross value added (GVA) and hours worked have changed since 2008. It also shows an output per hour trend line from Quarter 2 (Apr to Jun) 2009 to Quarter 4 (Oct to Dec) 2019. The latest growth was driven by an increase in GVA as hours worked did not grow despite the end of the CJRS and similar schemes in Quarter 3 (Jul to Sep) 2021.

Figure 2: Output per hour worked was 2.6 percentage points above pre-coronavirus pandemic levels

Gross value added, hours worked, output per hour worked, UK, index 2019 = 100, Quarter 1 (Jan to Mar) 2008 to Quarter 4 (Oct to Dec) 2021



Source: Office for National Statistics – Productivity overview, UK

Notes:

1. Average growth between Quarter 2 (Apr to Jun) 2009 (the low point after the 2008 economic downturn) and Quarter 4 (Oct to Dec) 2019 (the high point before the coronavirus (COVID-19) pandemic) is used as the trend, reflecting overall performance through this 10 year period. Productivity growth has been consistently slower since the 2008 economic downturn, so using trend growth from earlier years would be inappropriate.

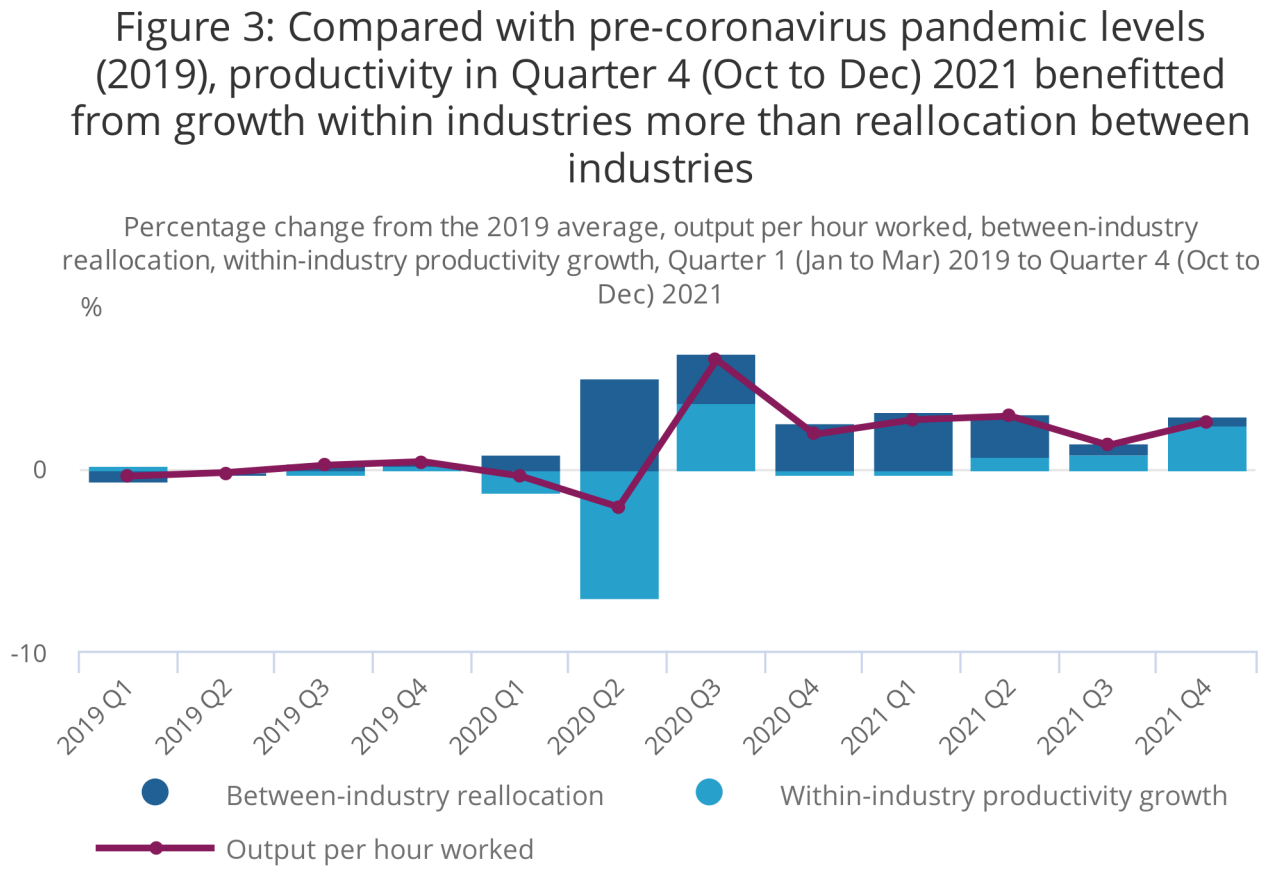
3 . Labour productivity by industry

Changes in labour productivity growth can be driven by industry productivity growth (the within-industry effect), shifts in the structure of the economy between more or less productive industries (reallocation effect), or a combination of both. Figure 3 decomposes productivity growth (output per hour) relative to pre-coronavirus pandemic levels (2019 average) into these two effects.

The contribution to productivity growth accounted for by the reallocation effect fell throughout 2021. However, the contribution from the within-industry effect increased for the fifth consecutive quarter. This could be because of the effects of the CJRS decreased, however the residual between-industry effect may also reflect the change in total hours worked and may react if this alters further in future quarters.

Figure 3: Compared with pre-coronavirus pandemic levels (2019), productivity in Quarter 4 (Oct to Dec) 2021 benefitted from growth within industries more than reallocation between industries

Percentage change from the 2019 average, output per hour worked, between-industry reallocation, within-industry productivity growth, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2021



Source: Office for National Statistics – Productivity overview, UK

Notes:

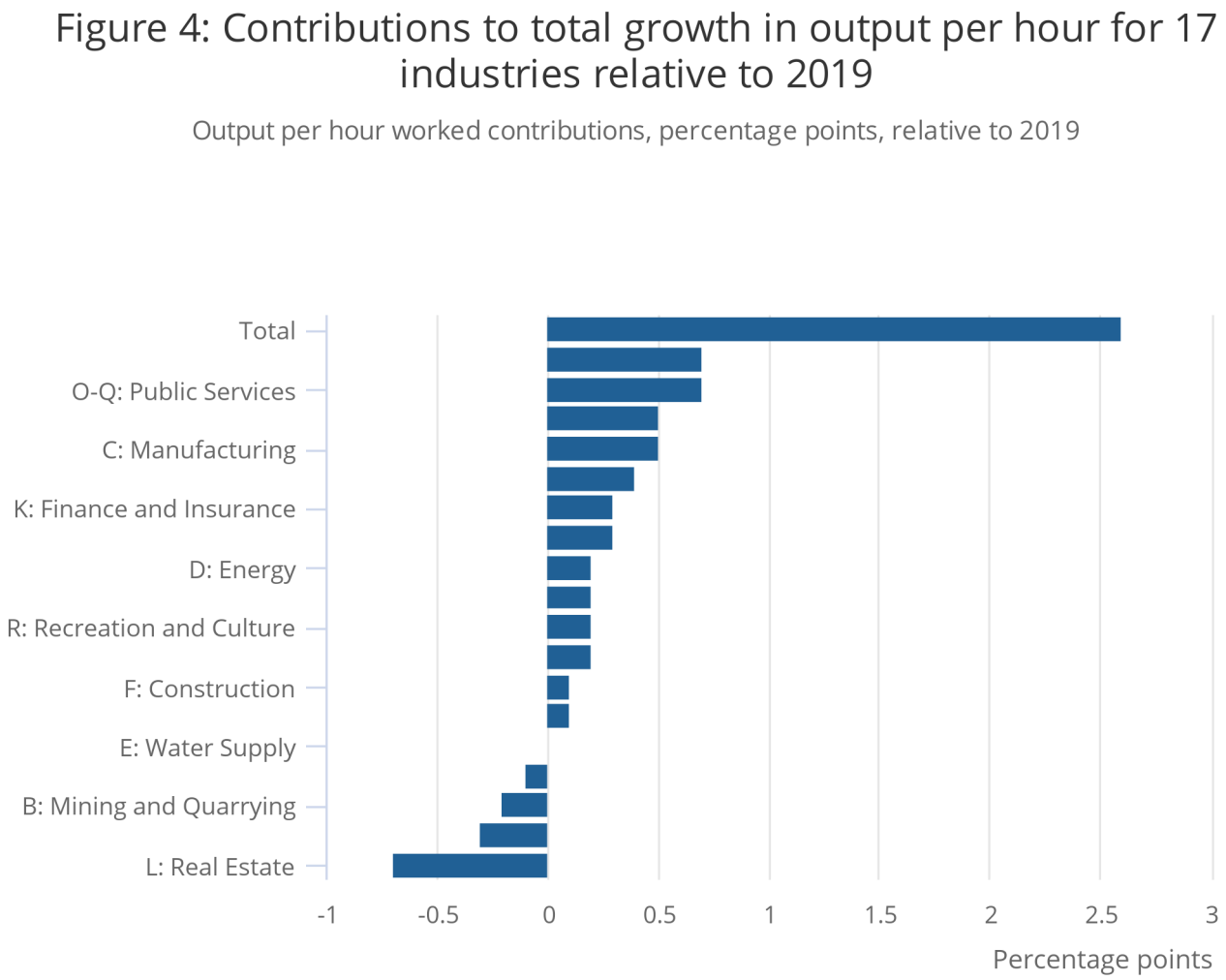
1. The between-industry effect is calculated across 17 industry sections. Different results may be found depending on the industry granularity entered into the analysis.

2. The between and within-industry effects may not add up to the output per hour total. This is because of the exclusion of the National Accounts balancing value.

Figure 4 shows the contribution to total growth in output per hour for 17 industries relative to 2019. Wholesale and retail industries, public services, manufacturing and business services had the biggest positive industry contribution to productivity growth. Real estate industry, administrative services, mining and quarrying, and other services all negatively contributed to productivity growth.

Figure 4: Contributions to total growth in output per hour for 17 industries relative to 2019

Output per hour worked contributions, percentage points, relative to 2019



Source: Office for National Statistics – Productivity overview, UK

4 . Multifactor productivity

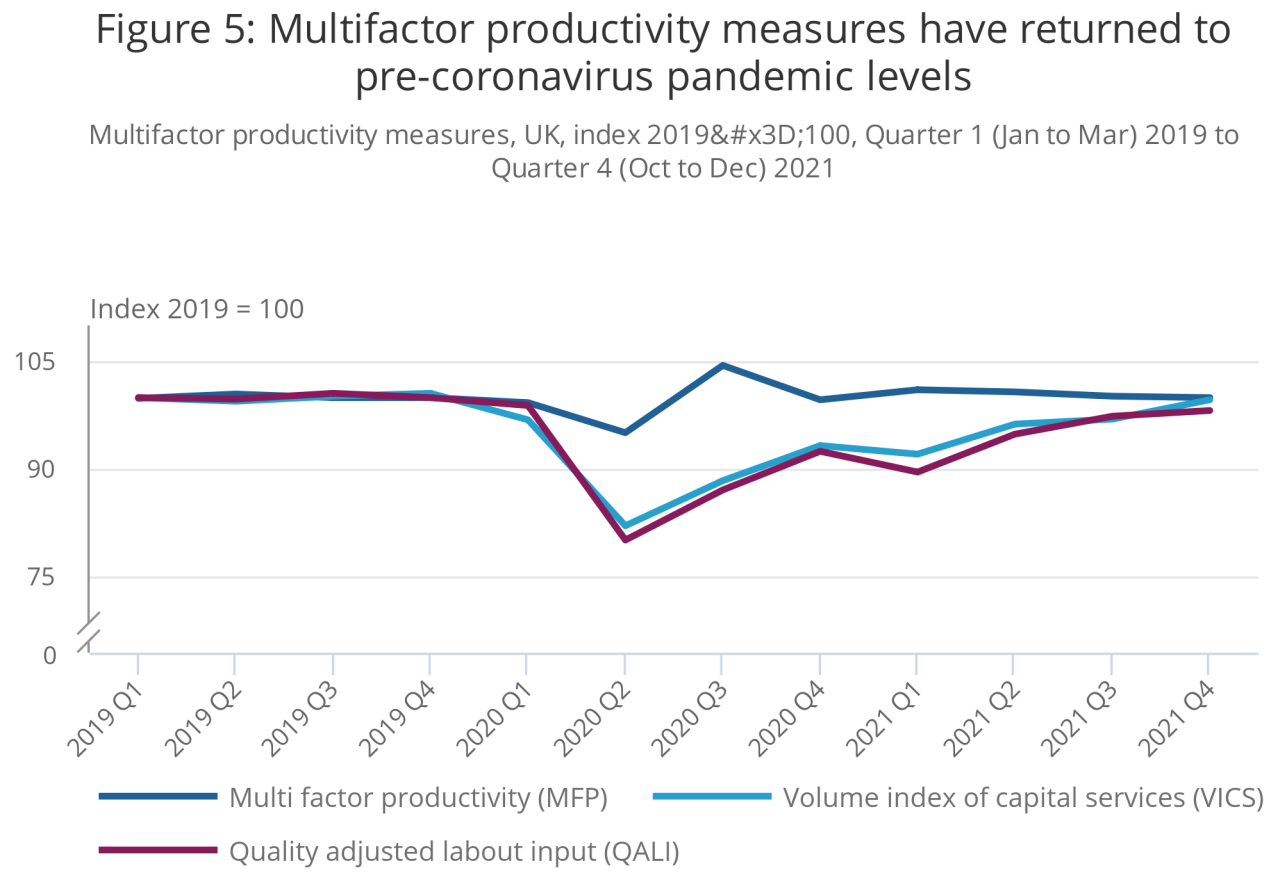
Following a period of volatility during the coronavirus (COVID-19) pandemic, multifactor productivity (MFP) has shown limited change since Quarter 4 (Oct to Dec) 2020. It is now 0.4% higher than in Quarter 4 2020. On an annual basis, MFP grew by 0.7% in 2021, with capital services and quality adjusted labour input (QALI) both growing at a slightly slower rate than gross value added (GVA).

We also provide an adjusted capital services measure over the coronavirus pandemic period to account for the impact of government furlough schemes. As furloughed workers are unable to utilise capital, we apply a utilisation adjustment based on hours growth to prevent an over-estimation of capital services used in the economy. If a factory closed during the coronavirus pandemic and furloughed its staff, neither the staff nor the machines contributed to output. The subsequent increase in both capital services and labour input over this period was driven by a 6% increase in hours worked between 2020 and 2021.

With the furlough scheme ending, we propose this to be the last quarter in which the utilisation factor is applied in its current form. We continue to assess other measures of adjusting for capital utilisation, although the adjustment used in this article continues to be our preferred measure of capital services over the furlough period.

Figure 5: Multifactor productivity measures have returned to pre-coronavirus pandemic levels

Multifactor productivity measures, UK, index 2019=100, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2021



Source: Office for National Statistics – Productivity overview, UK

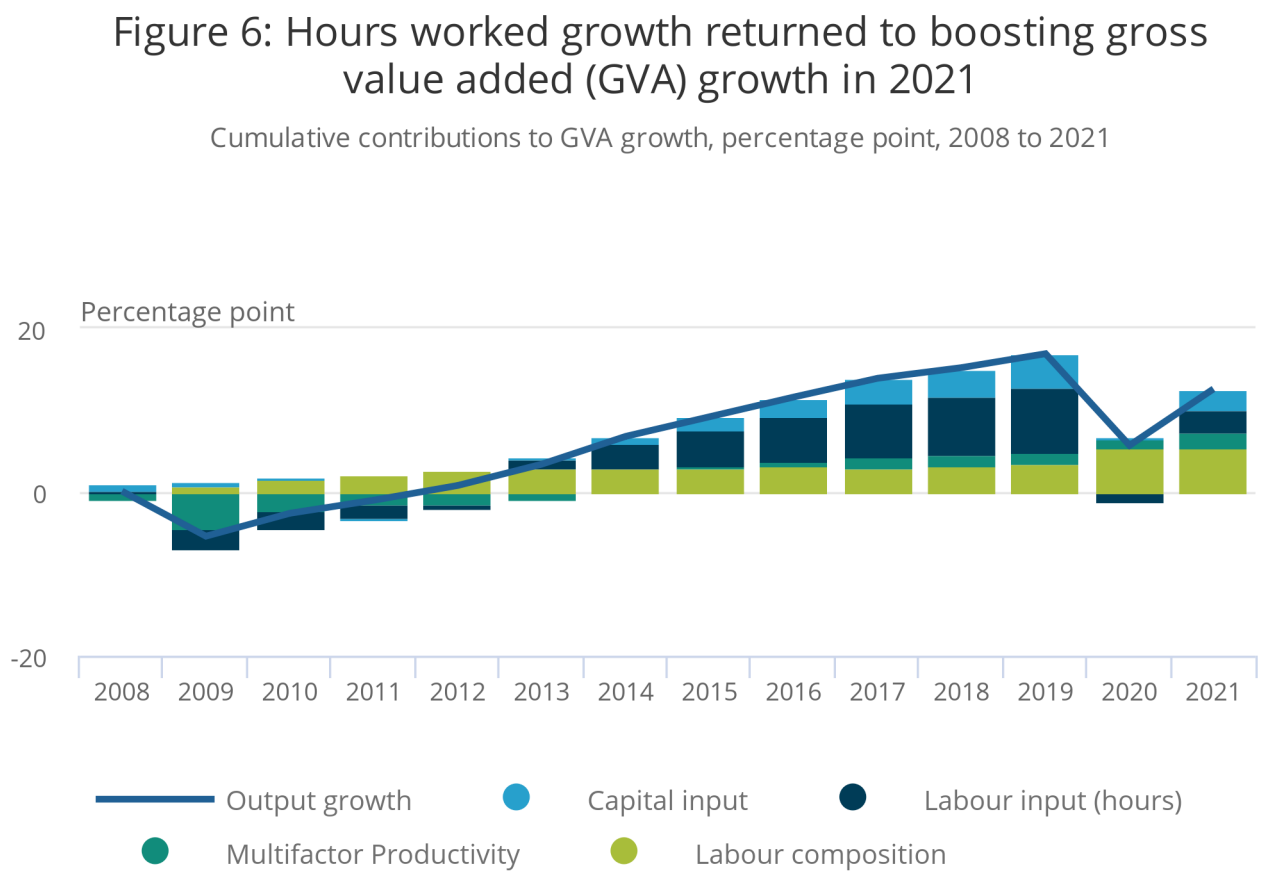
Output growth in the market sector can be decomposed into growth in the factors of production: capital services (the amount of productive capital available to businesses), quality-adjusted labour input (the number of hours worked weighted by workers' wages) and MFP (how well inputs are used in the production process).

Since the financial downturn of 2008 to 2009, hours have been the most significant driver of GVA growth in the UK, as opposed to capital, labour composition or MFP. This trend was dramatically affected by the coronavirus pandemic and the subsequent policies put in place.

Figure 6 shows that in 2021 hours worked returned to making a positive contribution to GVA. Most of this growth occurred in Quarter 2 (Apr to Jun) 2021. The within-firm productivity growth seen in the second half of 2021 (Figure 3) occurred during a period of slower growth in hours and relates more to growth in capital inputs, the other primary driver of the increase in GVA growth in 2021.

Figure 6: Hours worked growth returned to boosting gross value added (GVA) growth in 2021

Cumulative contributions to GVA growth, percentage point, 2008 to 2021



Source: Office for National Statistics – Productivity overview, UK

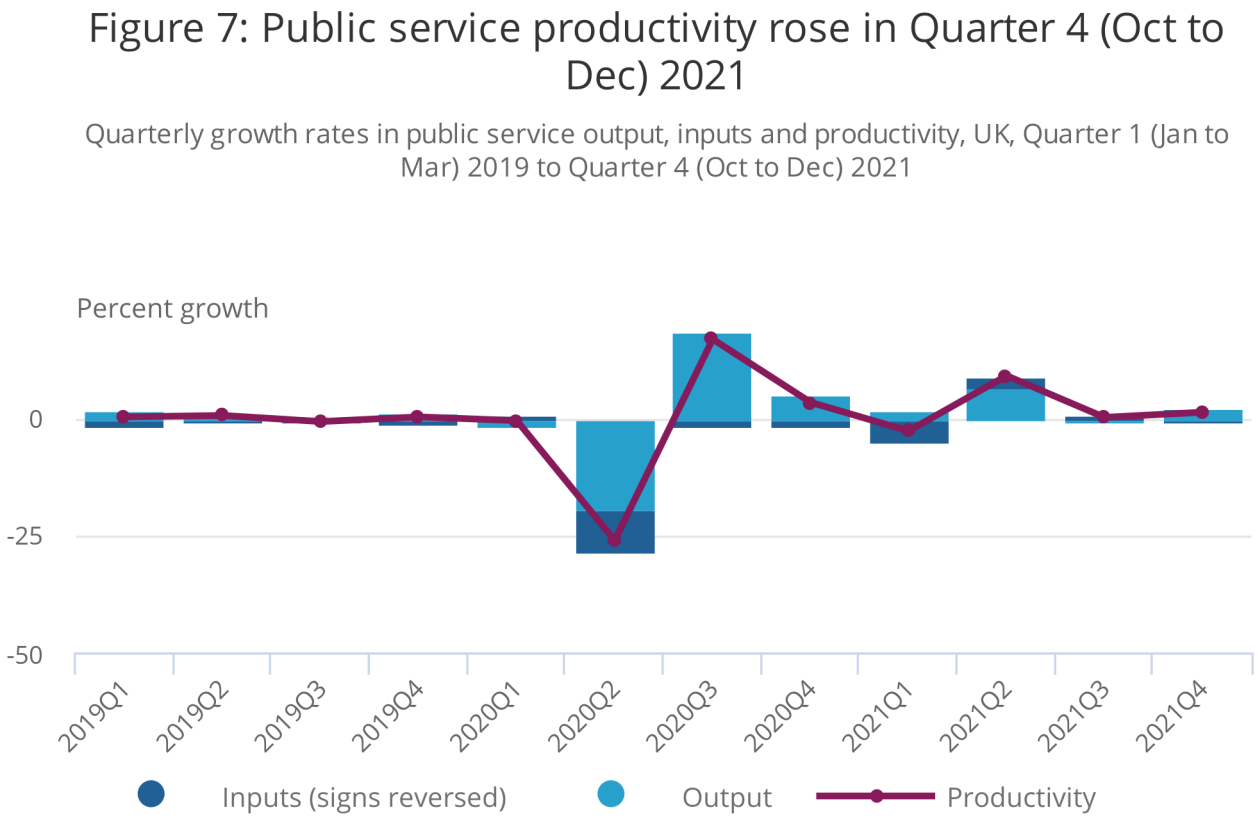
In contrast to hours, labour composition, which factors in the wages paid to workers, remained relatively flat in 2021. This followed a relatively strong contribution in 2020, when low-paid workers were more likely to be furloughed. Capital services, which is seen as vital to long-term productivity growth, increased by 7.0% in 2021, although its contribution to GVA has not recovered to pre-coronavirus pandemic levels.

5 . Public service productivity

Public service productivity rose by 1.3% in Quarter 4 (Oct to Dec) 2021, driven by a 2.1% rise in public service output. This was mainly the result of a large increase of coronavirus (COVID-19) testing, booster vaccinations, and GP appointments in healthcare activity. Inputs grew by 0.8% in Quarter 4 2021. The small rise in public service inputs was driven by the increase in healthcare, education, and defence.

Figure 7: Public service productivity rose in Quarter 4 (Oct to Dec) 2021

Quarterly growth rates in public service output, inputs and productivity, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2021

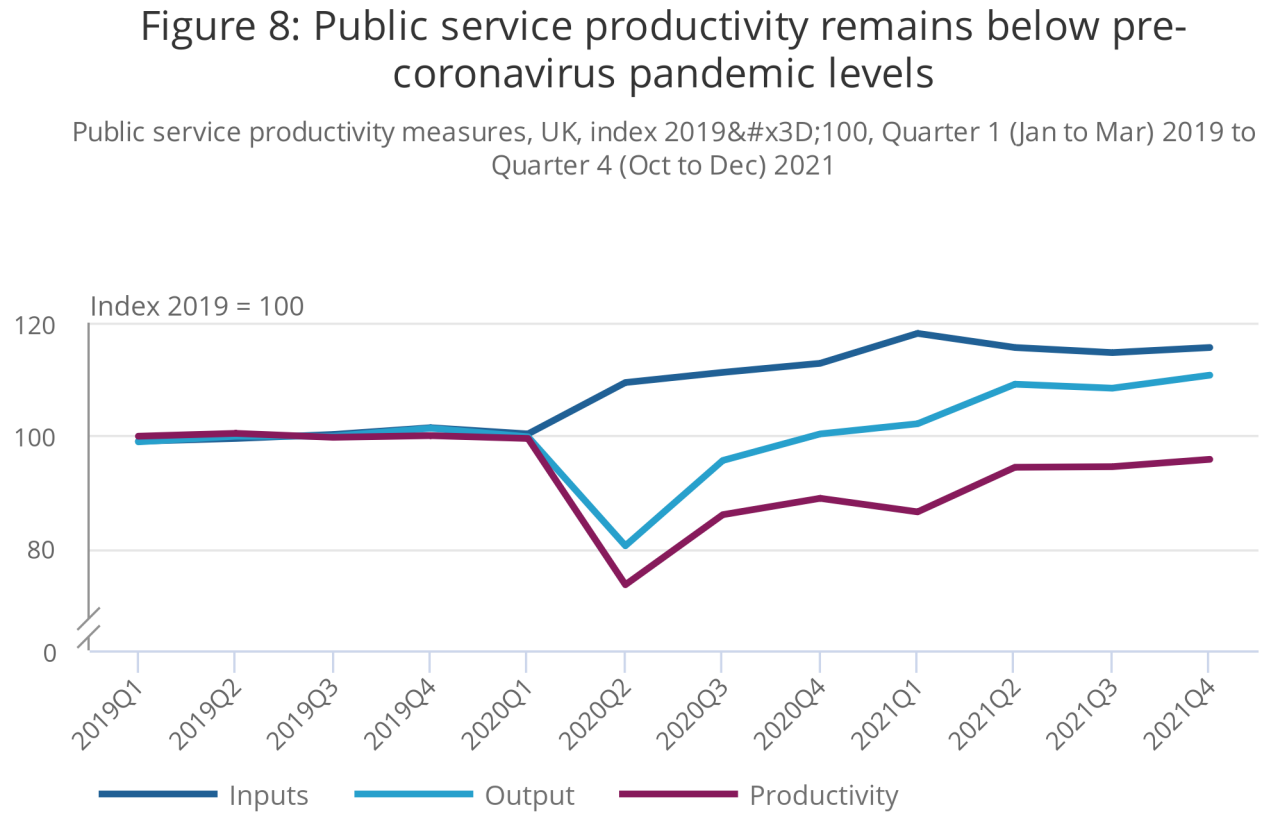


Source: Office for National Statistics – Productivity overview, UK

Public service productivity slowly recovered in Quarter 4 2021, but remained 4.2% lower than prior to the coronavirus pandemic, in terms of average 2019 levels. Both inputs and output were higher than in 2019, at 15.6% and 10.7% respectively.

Figure 8: Public service productivity remains below pre-coronavirus pandemic levels

Public service productivity measures, UK, index 2019=100, Quarter 1 (Jan to Mar) 2019 to Quarter 4 (Oct to Dec) 2021



Source: Office for National Statistics – Productivity overview, UK

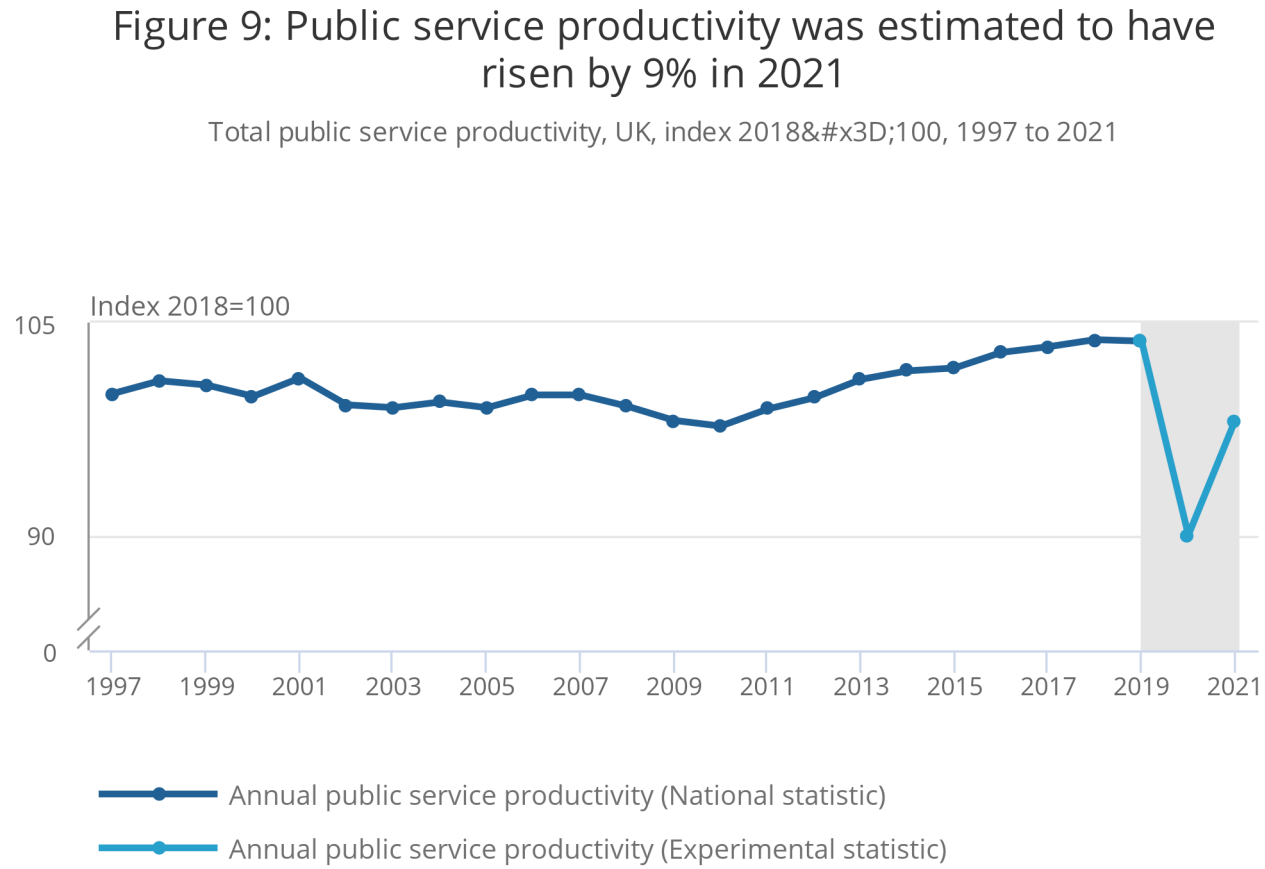
We are improving how we estimate non-market output for healthcare and non-market output for education.

Annual public service productivity is estimated to have risen by 9.0% in 2021, following an estimated fall of 13.1% in 2020. Restrictions related to the coronavirus pandemic caused a large fall in output at the start of the pandemic. Output then recovered somewhat in line with the easing of government restrictions, where a wider selection of services was provided and more classroom teaching was able to take place.

Increased healthcare activity associated with COVID-19 testing and vaccinations was important to output recovery. Inputs rose substantially in 2020 and 2021 because of increased spending to deal with the coronavirus pandemic.

Figure 9: Public service productivity was estimated to have risen by 9% in 2021

Total public service productivity, UK, index 2018=100, 1997 to 2021



Source: Office for National Statistics – Productivity overview, UK

Notes:

1. Estimates for 2020 and 2021 are experimental statistics

2. Estimates from 1997 to 2019 are National Statistics

These are experimental preliminary estimates that use less granular and comprehensive data sources compared with our annual public service productivity estimate. The experimental estimates of public service output account for the volume of activity, for example the number of GP appointments and school attendance. They do not account for the quality of output, such as effectiveness of NHS treatments, and attainment levels within schools.

Because of the lack of quality adjustment and additional quantity input and output data included in the annual measure, there can be large disparities between these preliminary estimates and those published in our Public service productivity: total article. We will publish more accurate estimates at an annual level for 2020 in early 2023. These will be National Statistics.

6 . Developments

Many of the datasets associated with this release changed in April 2022 to meet accessibility legislation. As a result, previously published labour productivity data can now be found in our three new datasets: output per hour worked, output per job and output per worker.

We have reviewed and updated the statistical badging of some of our estimates and added additional series including measures of productivity that exclude imputed rent from gross value added (GVA) where relevant. We will make further changes to our other datasets in the future. We welcome any feedback on our developments productivity@ons.gov.uk.

We have released our Productivity development plan for 2021 to 2023 where we set out plans to build on recent improvements to our productivity statistics and look to introduce new outputs. This follows the Office for Statistics Regulation assessment of Office for National Statistics productivity statistics in early 2021.

Economic statistics governance after EU exit

Following the UK's exit from the EU, new governance arrangements are being put in place that will support the adoption and implementation of high quality standards for UK economic statistics.

The new National Statistician's Committee for Advice on Standards for Economic Statistics (NSCASE) will ensure its processes for influencing and adopting international statistical standards are world leading. The advice it provides to the National Statistician will span the full range of domains in economic statistics, including the National Accounts, fiscal statistics, prices, trade and the balance of payments, and labour market statistics.

Read further information about NSCASE.

7 . Productivity overview data

Output per hour worked
Dataset | Released 7 April 2022
Estimates for gross value added (GVA), hours worked and output per hour worked by high, section and division level industry, as defined by the Standard Industrial Classification (SIC). Including annual and quarterly statistics. Contains estimates for industry quarter on quarter, year on year and quarter on year contributions to whole economy output per hour worked.

Output per job
Dataset | Released 7 April 2022
Estimates for GVA, jobs and output per job worked by high, section and division level industry, as defined by the Standard Industrial Classification (SIC). Including annual and quarterly statistics. Contains estimates for industry quarter on quarter, year on year and quarter on year contributions to whole economy output per job.

Output per worker
Dataset | Released 7 April 2022
Estimates for GVA, workers, and output per worker by high and section level industry, as defined by the Standard Industrial Classification (SIC). Contains annual and quarterly statistics.

Multi-factor productivity estimates
Dataset MFP01 | Released 7 April 2022
Indices and log changes for gross value added (GVA), multifactor productivity, implied factor prices, hours worked, labour composition, capital services and GVA per hour worked.

Public service productivity, quarterly
Dataset | Released 7 April 2022
Includes quarterly, annual and revisions tabs to see the picture for UK public service productivity and also to see how much has changed in the data.

8 . Glossary

Labour productivity

Labour productivity measures how many units of labour input is needed to produce a unit of output, and is calculated by dividing output by labour input.

Labour inputs

The preferred measure of labour input is hours worked (“productivity hours”), but workers and jobs (“productivity jobs”) are also used.

Output

Output refers to gross value added (GVA), which is an estimate of the volume of goods and services produced by an industry, and in aggregate for the UK.

Multifactor productivity

For any given change in output, multifactor productivity (MFP) measures the amount that cannot be accounted for by changes in inputs of quality-adjusted labour and capital.

Capital services

Capital services refer to the flow of productive services provided by an asset that is employed in production. Capital services are the appropriate measure of capital input in production analysis.

Labour composition

Labour composition measures the characteristics of the labour used in the production process. The labour measure used in multifactor productivity is quality-adjusted labour input (QALI), which splits the hours worked data using four categories: industry, age, sex, and education.

Public service productivity

Productivity of public services is estimated by comparing growth in the total amount of output with growth in the total amount of inputs used. Growth rates of output and inputs for individual service areas are aggregated by their relative share of total government expenditure (expenditure weight) to produce estimates of total public service output, inputs and productivity.

9 . Measuring the data

Revisions in this release

New estimates of gross value added (GVA) are more volatile on a quarterly basis than previously, especially in production industries. This reflects the use of new data and methods, but also challenges in reconciling quarterly and annual data. As productivity is a structural feature of the economy, we continue to advise users to focus on long-term trends of productivity.

This release reflects revisions to GVA and income data resulting from quarterly national accounts. Revisions to the data also reflect revisions to workforce jobs estimates affecting Quarter 3 (July to Sept) 2021. Revisions resulting from seasonal adjustment affect all periods.

We have revisions to GVA data back to Quarter 1 (Jan to March) 2020 which has resulted in revisions to our productivity estimates over the same period. For more information see GDP quarterly national accounts, UK: October to December 2021.

Methodological information

Multifactor productivity (MFP) estimates are compiled using the growth accounting framework. This decomposes changes in economic output, in this case GVA of the UK market sector, into contributions from changes in measured inputs: labour, capital and a residual element known as MFP. For more information, see our simple guide to multifactor productivity (MFP) and our multifactor productivity (MFP) QMI.

Information on data used in public service productivity can be found in our Public service productivity: quarterly, UK, October to December 2019 article and in Sources and methods for public service productivity estimates.

The measure of output used in these statistics is the chained volume (real) measure of gross value added (GVA) at basic prices.

10 . Strengths and limitations

During the coronavirus (COVID-19) pandemic there have been additional challenges to collecting labour market data and estimating gross domestic product (GDP). As a result, the estimates are subject to increased uncertainty and there is an increased likelihood of larger revisions than usual in future releases of these measures.

The data contained in this release are estimates. While they represent our best assessment of productivity in the UK, they will get revised as we receive more reliable data over time.

Gross value added (GVA) estimates get revised as part of the National Accounts publication process. Labour market data are infrequently revised to account for new information.

There are always potential risks to data quality including survey samples providing an inaccurate representation for the UK, respondent answers being incorrect, inaccurate data categorisations, and data compilation issues and errors. We work hard to mitigate these risks to ensure data quality remains high.

Some data in our publication has received the National Statistic badge, which demonstrates the compliance with the statistics Code of Practice, as assessed by the Office for Statistics Regulation. Other data has an experimental badge, which denotes that we are still developing these data to create the best output possible. All data goes through rigorous quality assurance to provide the best estimates available.

More information on the strengths and limitations of the data, as well as their quality and accuracy, is available in the Labour productivity QMI, the Multifactor productivity (MFP) QMI, and the Public service productivity: total, UK QMI. Further information is available in Sources and methods for public service productivity estimates.

11 . Related links

GDP quarterly national accounts, UK: October to December 2021
Bulletin | Released 31 March 2022
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.

Labour market overview, UK: March 2022
Bulletin | Released 15 March 2022
Estimates of employment, unemployment, economic inactivity and other employment-related statistics for the UK.

Public service productivity: total, UK, 2019
Article | Released 22 February 2022
Updated measures of output, inputs and productivity for public services in the UK between 1997 and 2019. Includes service area breakdown, as well as impact of quality adjustment and latest revisions.

UK productivity flash estimate: October to December 2021
Article | Released 15 February 2022
Flash estimate of labour productivity for Quarter 4 (Oct to Dec) 2021 based on latest data from GDP first quarterly estimate and labour market statistics.

Labour costs and labour income, UK: 2021
Article| Released 10 November 2021
Annual commentary with quarterly dataset of the labour share of income, unit labour costs (ULC) and average labour compensation per hour (ALCH), with industry breakdowns.