Article

Productivity overview, UK: July to September 2022

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 worked was 1.6% higher in Quarter 3 (July to Sept) 2022 than the average level in 2019, before the coronavirus (COVID-19) pandemic.

- Output per worker in Quarter 3 2022 was 0.5% higher than the average level in 2019 before the coronavirus pandemic, but 0.1% lower than in Quarter 2 (Apr to June) 2022.

- Output per job in Quarter 3 2022 was 0.2% higher than the average level in 2019, before the coronavirus pandemic.

Public service productivity

- Public service productivity has remained mostly steady since Quarter 2 2021 compared with the quarters affected by the coronavirus pandemic.

- Public service productivity decreased by 1.3% in Quarter 3 2022 compared with the previous quarter, caused by a faster growth in inputs than output (2.2% and 0.9% respectively).

- Public service productivity remained around 7.4% below its pre-coronavirus pandemic levels in Quarter 3 2022; users should note quarterly public service productivity estimates are experimental statistics.

This release includes the quarterly estimates for labour productivity and public service productivity. It does not include growth accounting datasets, including multifactor productivity.

2 . Labour productivity

Output per hour worked, our headline measure of labour productivity, was 1.6% above its pre-coronavirus (COVID-19) pandemic levels (2019 average level). The growth in output per hour worked was driven by a fall in the number of hours worked (1.2%) with output only marginally increasing by 0.3%. Output per worker and output per job were above their pre-coronavirus pandemic levels, at 0.5% and 0.2%, respectively.

Output per hour grew by 0.9% in the year to Quarter 3 (July to Sept) 2022. Over the same period, output per worker and output per job grew by 1.4% and 1.2%, respectively. This suggests there was little movement in the ratio of jobs to workers during this period and reflects how both metrics performed through the coronavirus pandemic period.
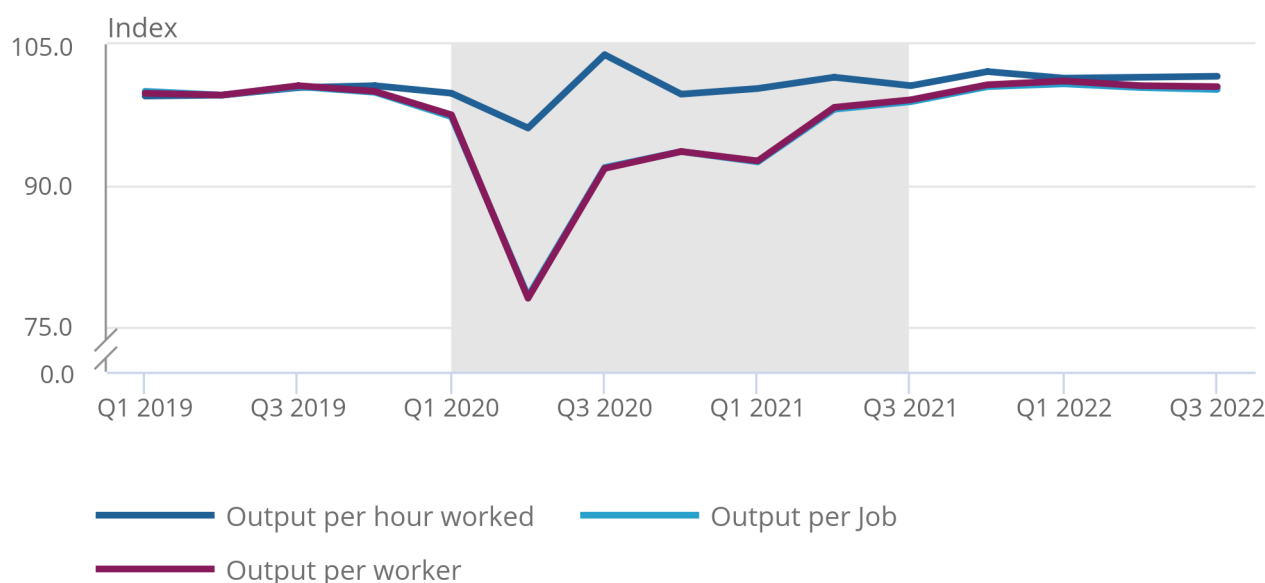
Output per hour worked increased by 0.1% in Quarter 3 2022 compared with the previous quarter. Output per worker decreased by 0.1% and output per job decreased by 0.2% over the same period.

Figure 1: Labour productivity measures have stabilised similar to pre-coronavirus (COVID-19) pandemic levels

Labour productivity measures, UK, index 2019=100, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2022

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Labour productivity measures, UK, index 2019=100, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2022

Source: Office for National Statistics – Productivity overview, UK

Notes:

1. The employment support schemes introduced because of the pandemic resulted in divergence in our estimates of labour productivity as measured by output per worker and output per job. We consequently had to adjust our output per job measure to exclude furloughed jobs to estimate this measure more accurately. As this is the fourth full quarter since the closure of the Coronavirus Job Retention Scheme (CJRS) and the Self Employment Income Support Scheme (SEISS), we have stopped our experimental "Output per job excluding furloughed workers" dataset. The data show convergence in the measures following the period when furlough was in action, where they diverged because of the employment support schemes introduced during the coronavirus pandemic.
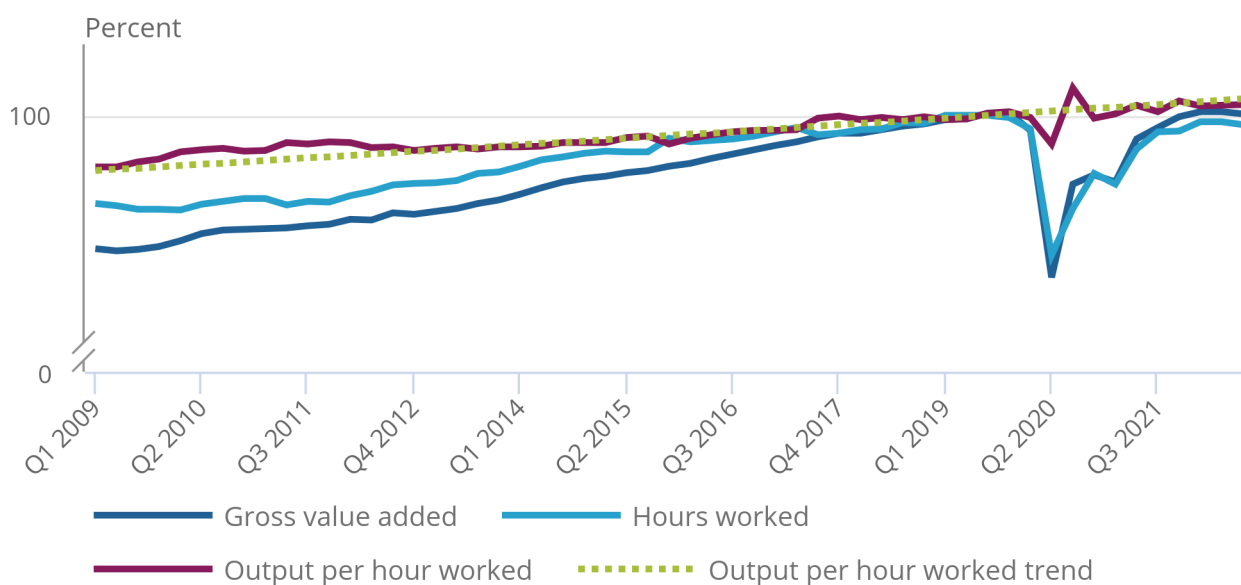
Figure 2 shows that the quarter-on-quarter growth in output per hour worked for Quarter 3 2022 was relatively flat (0.1%), reflecting falls of equal magnitude in gross value added (GVA) growth (0.3%) and the number of hours worked (0.4%).

Figure 2: Output per hour worked increased by 0.1% in Quarter 3 (July to Sept) 2022 compared with Quarter 2 (Apr to June) 2022

Gross value added, hours worked, output per hour worked, UK, index 2019 = 100, Quarter 1 (Jan to Mar) 2009 to Quarter 3 (July to Sept) 2022

Figure 2: Output per hour worked increased by 0.1% in Quarter 3 (July to Sept) 2022 compared with Quarter 2 (Apr to June) 2022

Gross value added, hours worked, output per hour worked, UK, index 2019 = 100, Quarter 1 (Jan to Mar) 2009 to Quarter 3 (July to Sept) 2022

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 pandemic) is used as the trend as this is a long enough period to establish a trend line. Productivity growth has been consistently slower since the 2008 economic downturn, so using trend growth from earlier years would be inappropriate.
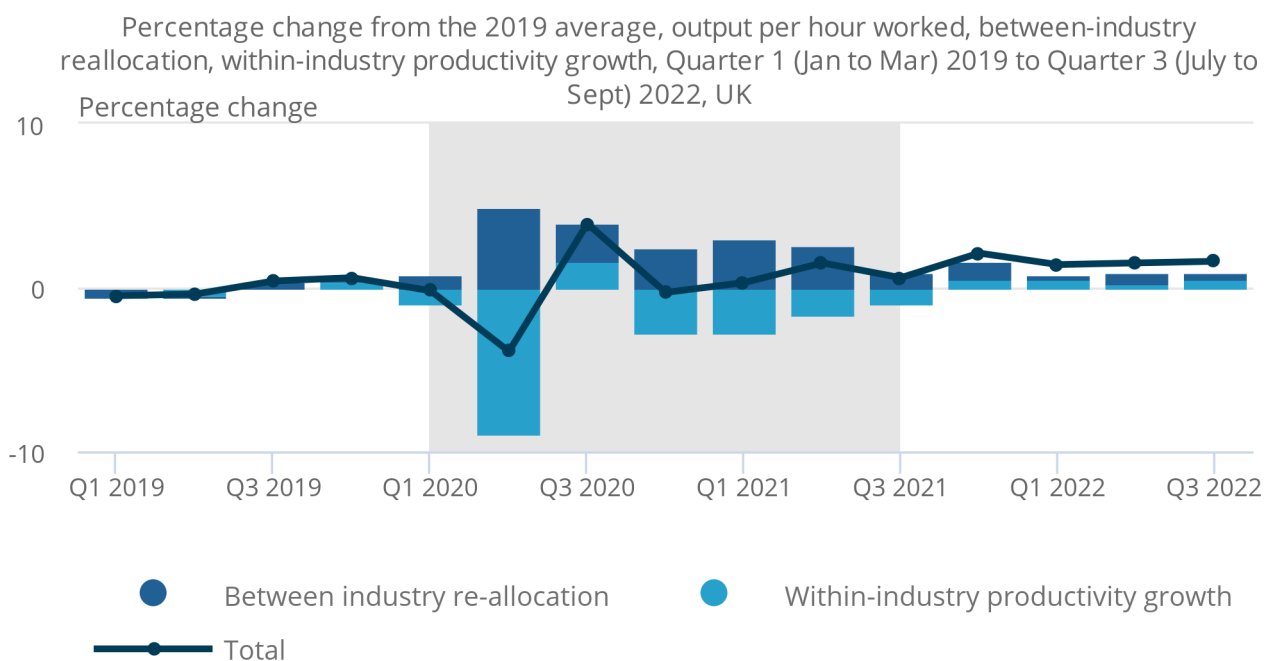
3 . Labour productivity by industry

Whole economy growth in productivity is affected by reallocation of economic activity between industries (the between-industry effect), as well as the direct contributions from productivity growth within industries (the within-industry effect).

The trend within the quarters following the end of the COVID-19 employment support schemes in Quarter 3 (Jul to Sept) 2021 shows productivity growth has been driven by a combination of within-industry and between-industry allocation effects. As lockdown restrictions eased, the contribution to productivity growth caused by the between-industry effect has been less pronounced relative to the coronavirus pandemic period. The positive contribution of between-industry allocation effects to productivity growth is a noticeable change from the pre-coronavirus period when, in 2019, there were periods of negative between-industry effects.

Figure 3: Following the closure of the coronavirus (COVID-19) employment support schemes, this is the fourth consecutive quarter of positive within-industry contributions to productivity growth

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 3 (July to Sept) 2022, UK

Figure 3: Following the closure of the coronavirus (COVID-19) employment support schemes, this is the fourth consecutive quarter of positive within-industry contributions to productivity growth

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 3 (July to Sept) 2022, UK

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 UK National Accounts balancing value.
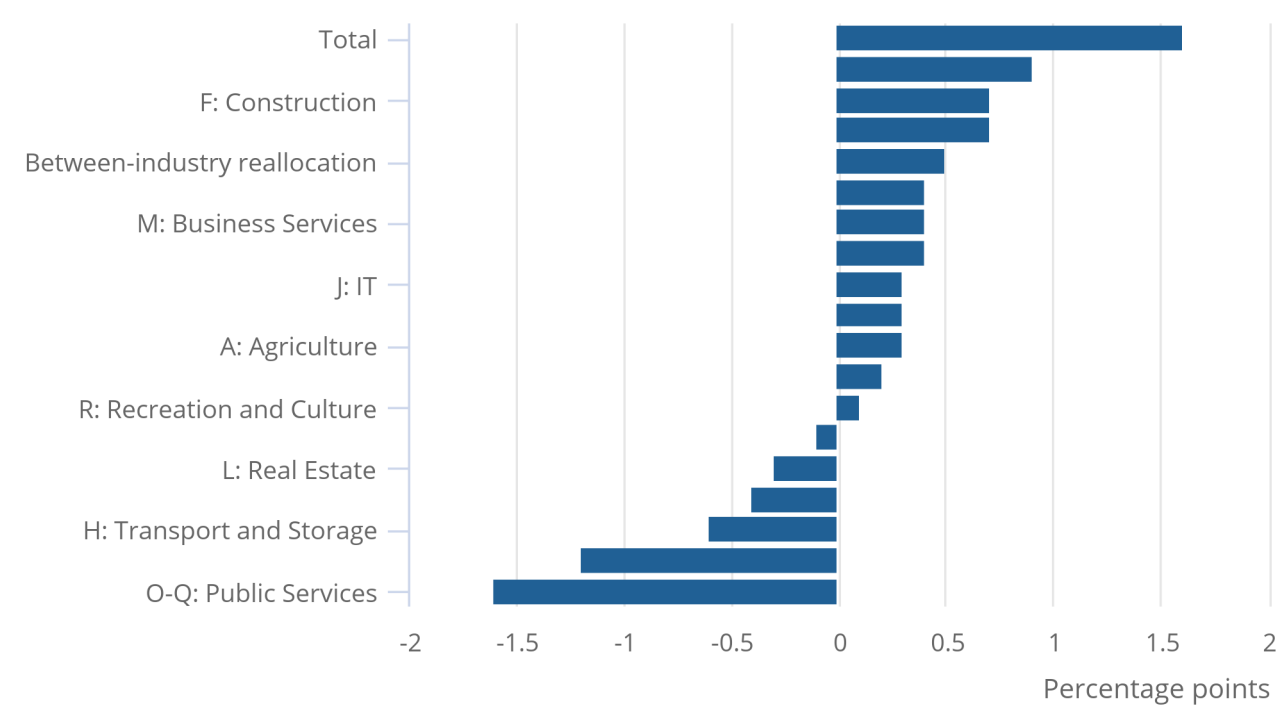
Figure 4 shows the contribution to total growth in output per hour worked for 17 industries relative to the 2019 average. Manufacturing, construction and administrative service industries had the biggest positive industry contribution to productivity growth. By contrast, public services, and wholesale and retail industries negatively contributed to productivity growth. The mining and quarrying, and the recreation and culture industries made little, if any, contribution to productivity growth in Quarter 3 2022.

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

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

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

Source: Source: Office for National Statistics – Productivity overview, UK

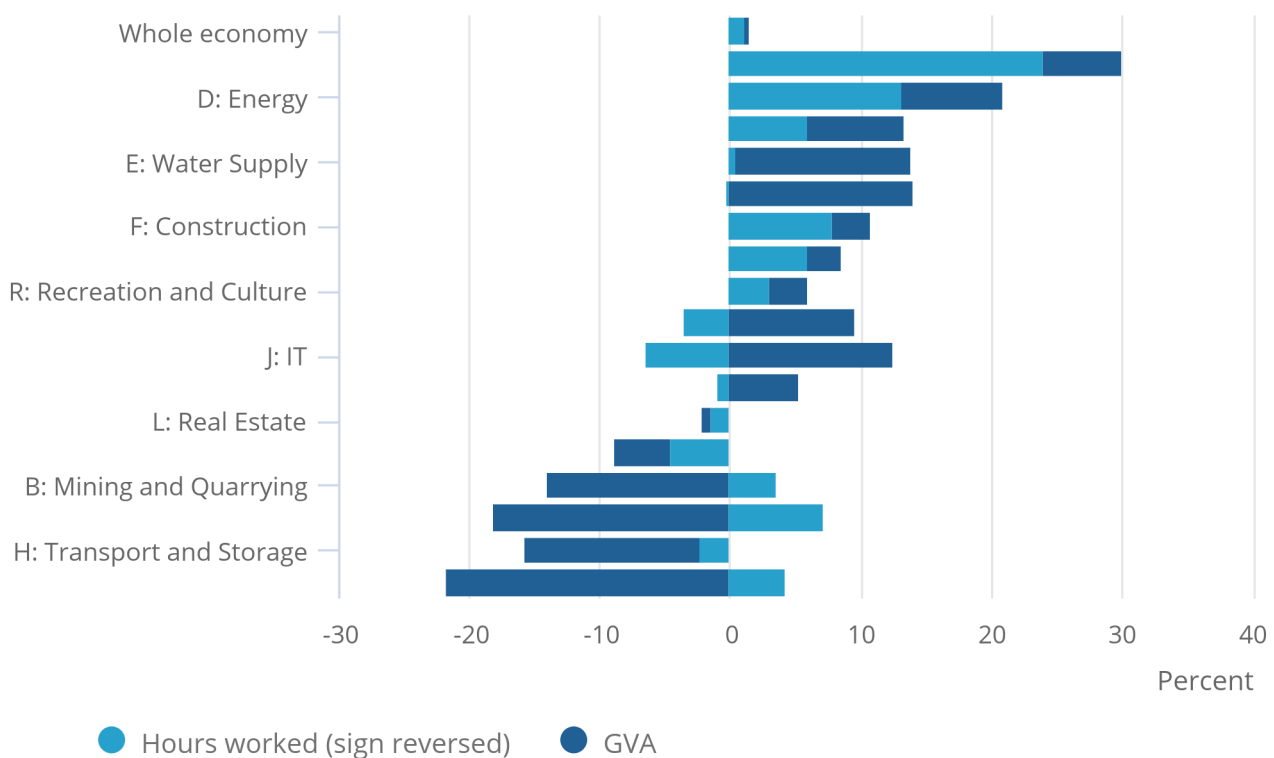# 4 . Output per hour worked by industry

Agriculture and energy saw the largest increase in output per hour worked in Quarter 3 (July to Sept) 2022 compared with their 2019 pre-coronavirus (COVID-19) pandemic levels, mainly driven by a decrease in the number of hours worked. Other services (a residual category including personal service activities not covered elsewhere in the SIC 2007 classification), transport and storage, and wholesale and retail industries had the biggest falls in Quarter 3 2022 compared with 2019 pre-pandemic levels. This was driven by the decrease in gross value added (GVA).

Figure 5: Productivity growth at the whole economy level was supported mainly by the decrease in the number of hours worked compared with 2019

Hours worked and gross value added, quarter versus pre-coronavirus (COVID-19) pandemic, percentage change, UK, Quarter 3 (July to Sept) 2022

Figure 5: Productivity growth at the whole economy level was supported mainly by the decrease in the number of hours worked compared with 2019

Hours worked and gross value added, quarter versus pre-coronavirus (COVID-19) pandemic, percentage change, UK, Quarter 3 (July to Sept) 2022

Source: Source: Office for National Statistics – Productivity overview, UK
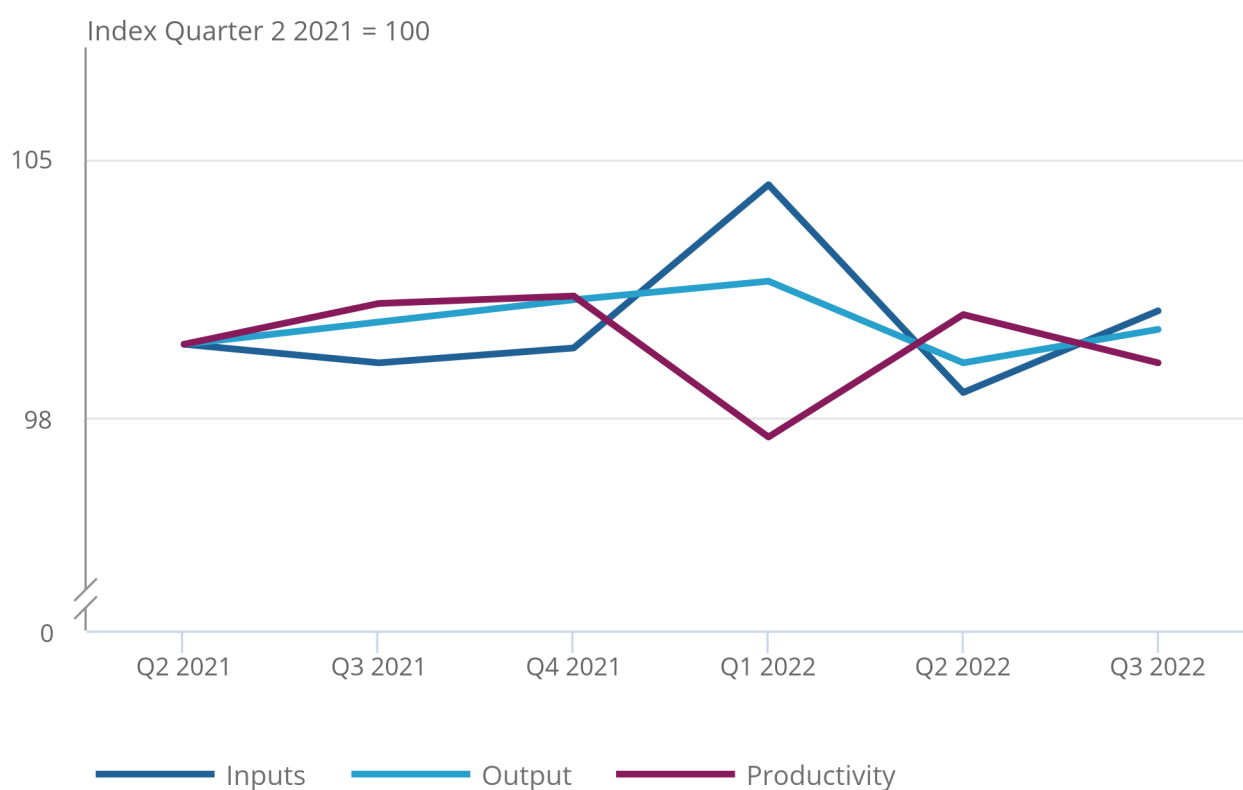
5 . Public service productivity

Public service productivity has remained mostly steady since Quarter 2 (Apr to Jun) 2021, despite a small fall in the latest quarter. Inputs are only 0.9% larger than they were in Quarter 2 2021 and output only 0.4% larger. Productivity has fallen by 0.5% since Quarter 2 2021.

Figure 6: Public service productivity has remained mostly steady between Quarter 2 (Apr to June) 2021 and Quarter 3 (July to Sept) 2022

Public service productivity, UK, index Quarter 2 2021=100, Quarter 2 (Apr to Jun) 2021 to Quarter 3 (July to Sept) 2022

Figure 6: Public service productivity has remained mostly steady between Quarter 2 (Apr to June) 2021 and Quarter 3 (July to Sept) 2022

Public service productivity, UK, index Quarter 2 2021=100, Quarter 2 (Apr to Jun) 2021 to Quarter 3 (July to Sept) 2022

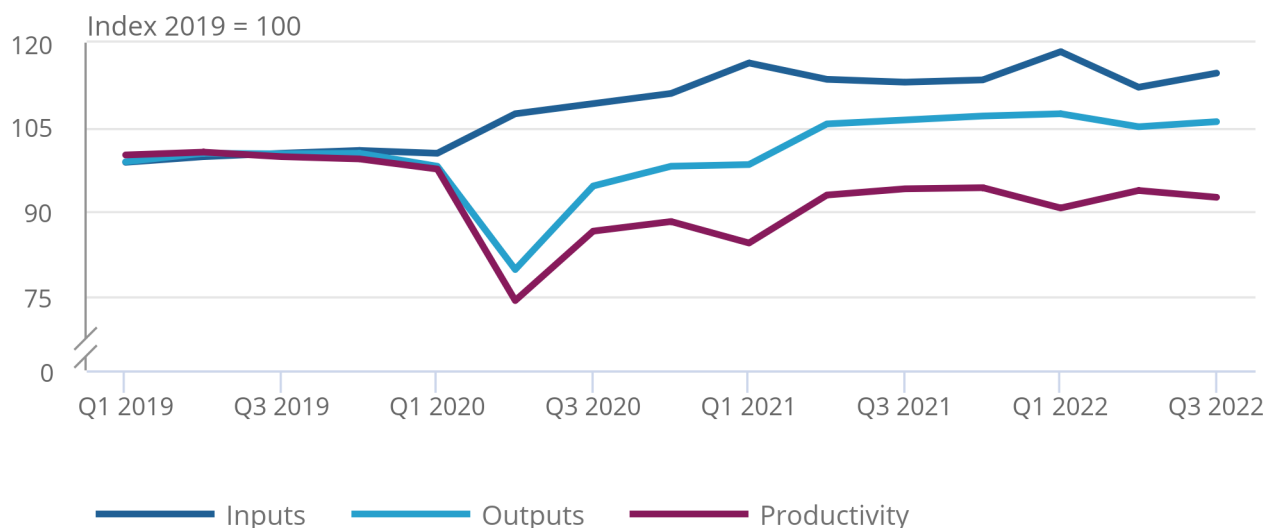**Source: Office for National Statistics – Productivity overview, UK**

Public service productivity remained around 7.4% below its pre-coronavirus pandemic levels in Quarter 3 (July to Sept) 2022. The volume of both inputs and output remains higher than the 2019 average levels, driven by the response to the coronavirus (COVID-19) pandemic.

Figure 7: Public service productivity has still not recovered to pre-coronavirus (COVID-19) pandemic levels

Public service productivity, UK, index 2019=100, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2022

Figure 7: Public service productivity has still not recovered to pre-coronavirus (COVID-19) pandemic levels

Public service productivity, UK, index 2019=100, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2022

Source: Office for National Statistics – Productivity overview, UK

Inputs growth may be partly a result of some seasonality relating to expenditure patterns within the financial year. More detail can be found in Measuring the data. As such, any quarter-on-quarter estimates are best assessed with reference to a longer time series.

Public service productivity decreased by 1.3% in Quarter 3 2022. The quarter-on-quarter fall in public service productivity was driven by a 2.2% increase in public service inputs, compared with a 0.9% increase in public service output.
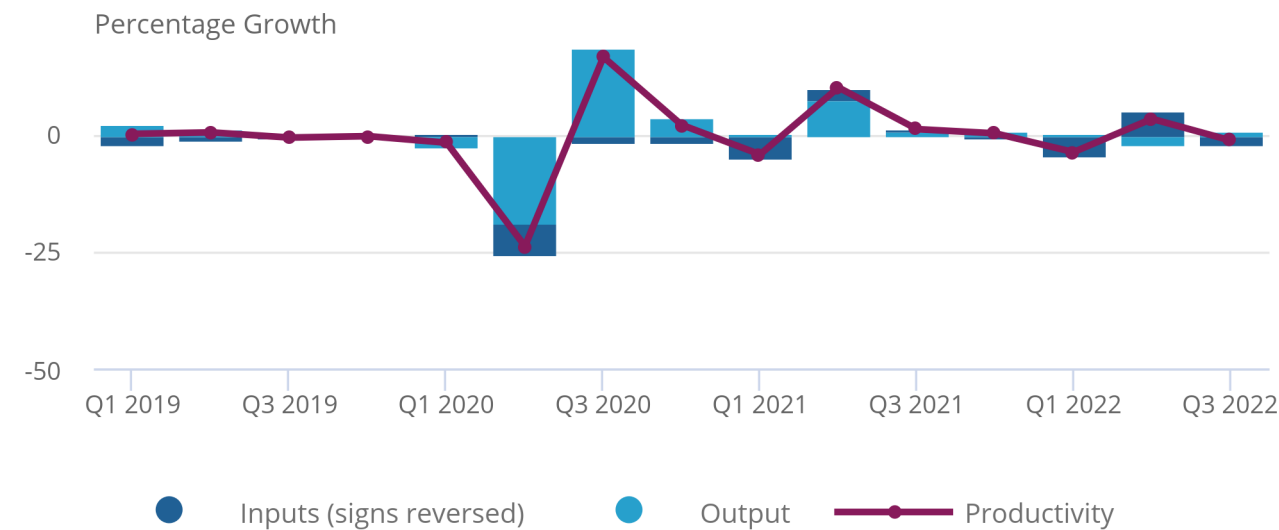
A reduction in coronavirus-related activities (NHS Test and Trace and the COVID-19 vaccination programme) has contributed to a slow increase in healthcare output in Quarter 3 2022. These activities now provide only a very small contribution to healthcare output. Healthcare inputs grew considerably faster than healthcare output in Quarter 3 2022 and is the main reason for the decrease in public service productivity in Quarter 3 2022.

Figure 8: Public service productivity fell by 1.3% in Quarter 3 2022, driven by inputs growing faster than output

Quarter on quarter growth rates in public service output, inputs and productivity, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2022

Figure 8: Public service productivity fell by 1.3% in Quarter 3 2022, driven by inputs growing faster than output

Quarter on quarter growth rates in public service output, inputs and productivity, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2022

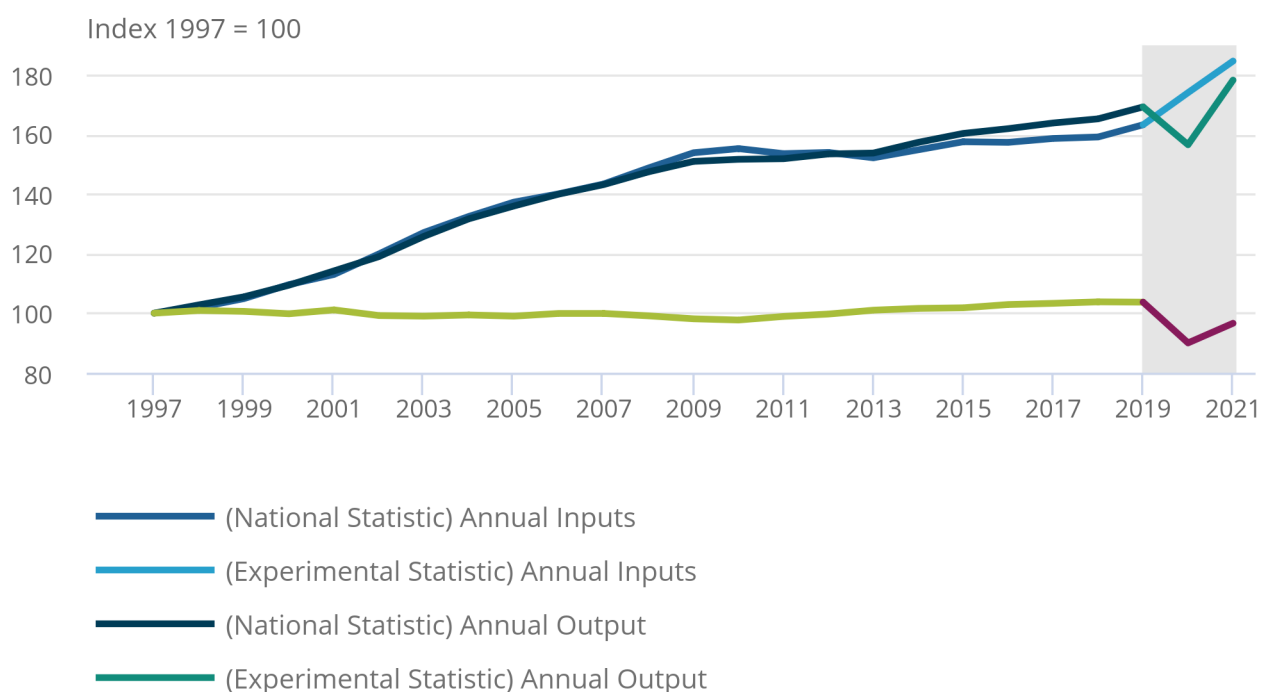**Source: Office for National Statistics – Productivity overview, UK**

Figure 9 shows annual total public service productivity rose by 7.3% in 2021, when placing these movements in an annual context over a longer time series. This was following an estimated fall of 13.2% in 2020. Inputs are estimated to have risen by 6.6% in 2020 and 6.1% in 2021. Output is estimated to have fallen by 7.5% in 2020 and risen by 13.9% in 2021.

Figure 9: Public service productivity is estimated to rise by 7.3% in 2021

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

Figure 9: Public service productivity is estimated to rise by 7.3% in 2021

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

Index 1997 = 100

Legend:
- (National Statistic) Annual Inputs
- (Experimental Statistic) Annual Inputs
- (National Statistic) Annual Output
- (Experimental Statistic) Annual Output

Source: Office for National Statistics – Productivity overview, UK

This estimate should be treated with caution until the annual public service productivity estimate for 2020 is available, as it does not currently include adjustments for changes in the quality of services delivered and, in many cases, uses more timely but less detailed data sources than the annual estimates.

The quarterly estimate in Quarter 1 (Jan to Mar) 2022 and Quarter 2 (Apr to June) 2022 do not affect the experimental annualised productivity estimate in 2021.

6 . Data

7 . Glossary

Labour productivity

Labour productivity measures how many units of output are produced for each unit of labour input, 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.

Multi-factor productivity

For any given change in output, multi-factor 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.

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.

8 . Measuring the data

Labour productivity

Methodological information

Productivity estimates and their inputs are produced to a number of decimal points as reported in the linked datasets. However, within the bulletin we have rounded to one decimal point.

Seasonal adjustment

Our latest estimates are calculated using new seasonal adjustment parameters. As such, any differences in the labour productivity estimates reported in the UK productivity flash estimate: July to September 2022 article and our current estimates, are a combination of:

- updates to our initial estimates of gross value added (GVA) in Quarter 3 (July to Sept) 2022

- the incorporation of data from the Short Term Employment Survey (STES)

- the new seasonally adjusted data

Public service productivity

Methodological information

It is important to note that these statistics include some forecasted data, as explained in our previous release.

Seasonal adjustment

The coronavirus (COVID-19) pandemic has made it more difficult to balance keeping unusual coronavirus-related expenditure patterns within the appropriate quarters and adjusting for the genuine quarter-on-quarter seasonality. There have also been challenges to ensure data within the coronavirus pandemic are not interpreted as seasonality, which would lead to excessive revisions in the back series. While the current adjustment methods take into account the seasonality, we intend to introduce a new approach to seasonal adjustment in the future, assuming improvements can be made. As a result, these statistics will be reviewed in future publications.

9 . Strengths and limitations

Information on the strengths and limitations of the data, as well as the quality and accuracy of the data, is available in the Labour productivity Quality and Methodology Information (QMI) report and in the Public service productivity: total, UK QMI report. Further information is available in our Sources and methods for public service productivity estimates methodology article.

10 . Related links

[GDP quarterly national accounts, UK: July to September 2022](#)
Bulletin | Released 22 December 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: December 2022](#)
Bulletin | Released 13 December 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.

[Sources and methods for public service productivity estimates](#)
Methodology | Released 11 May 2022
Sources and methods information for public service productivity: total, UK publication, detailing the main concepts, output and inputs measures by service area.

[UK productivity flash estimate: July to September 2022](#)
Article | Released 15 November 2022
Flash estimate of labour productivity for Quarter 3 (July to Sept) 2022 based on the latest data from the gross domestic product (GDP) first quarterly estimate and labour market statistics.

[Labour costs and labour income, UK: 2022](#)
Bulletin | Released 13 May 2022
Labour share of income, unit labour costs (ULCs), unit wage costs (UWCs) and average labour compensation per hour worked (ALCH), broken down by industry.

11 . Cite this statistical bulletin

Office for National Statistics (ONS), released 26 January 2023, ONS website, article, [Productivity overview, UK: July to September 2022](#)