Office for National Statistics

Article

Productivity overview, UK: July to September 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 worked fell by 1.4% quarter-on-quarter in Quarter 3 (July to Sept) 2021 but was 1.1% above the average level in 2019, prior to the coronavirus (COVID-19) pandemic.

- Output per worker was 0.6% below pre-coronavirus pandemic levels, despite a rise of 0.3% on the quarter.

Multifactor productivity

- Multifactor productivity (MFP) was 1.5% above its 2019 average level in Quarter 3 2021.

- Lower capital services, employment and within-industry MFP reduced market sector output by 3.4% compared to pre-pandemic levels in Quarter 3 2021.

Public service productivity

- Public service productivity was 8.1% lower than the 2019 average level; over the coronavirus pandemic, growth in inputs of 18.6% has outpaced growth in output of 8.9%.

- Public service productivity increased by 0.6% in Quarter 3 2021, compared with the previous quarter, driven by the first fall in public service inputs since before the coronavirus pandemic.

2 . Latest statistics

Productivity statistics in Quarter 3 (July to Sept) 2021 were still affected by the Coronavirus Job Retention Scheme (furlough), which closed at the end of September 2021. As a result, the divergence between productivity measures affected by the furlough scheme is narrowing and could be expected to close further in Quarter 4 (Oct to Dec) 2021.

Figure 1: Most productivity measures continue to return to pre-coronavirus (COVID-19) pandemic levels

Various productivity measures, UK, index 2019=100, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2021

Download the data

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Output per hour worked was 1.1% above pre-coronavirus pandemic levels, despite a 1.4% decrease compared with Quarter 2 (Apr to June) 2021. Output per worker continued to recover with a 0.3% increase quarter-on-quarter but remaining 0.6% below pre-coronavirus levels. The convergence of output per hour worked and output per worker estimates was significantly driven by the unwinding of the furlough scheme, which has differential impacts on these two measures.

Experimental estimates of output per job were 3.7% above pre-coronavirus pandemic levels in Quarter 3 2021, previously 7.9% above in Quarter 2 2021. These estimates exclude furloughed workers.

This continues to suggest that lower productivity industries had disproportionately higher levels of furlough, which increased aggregate productivity, and that furlough is now unwinding.

Multifactor productivity was 1.5% above pre-coronavirus pandemic levels in Quarter 3 2021, although this was 0.5% lower than in Quarter 2 2021. Market sector hours worked increased in the latest quarter, whereas labour composition continued to decline from its peak in Quarter 3 (July to Sept) 2020. This shift is because of lower skilled workers, who were most affected by furlough policies, working an increasing number of hours as the economy moves towards pre-coronavirus pandemic levels of hours worked.

Capital services increased slightly in the latest quarter, driven by an increase in capital utilisation as hours worked increased. However, underlying capital services continued to fall, reflecting weak business investment.

After a large increase in the previous quarter, public service productivity was more stable in Quarter 3 2021. Public service output fell modestly, driven by a small contraction in healthcare activities, while test and trace and vaccination activity continued and schools remained open. Public service inputs fell 1.5%, the first fall since the beginning of the coronavirus pandemic.

Despite the increase in the latest quarter, public service productivity was 8.1% lower than the 2019 level, prior to the coronavirus pandemic. Over the pandemic, growth in inputs of 18.6% has outpaced growth in output of 8.9%. The output measure is not adjusted for changes in service quality in these statistics.

3 . Labour productivity headline measures

Figure 2 shows how output per hour worked, gross value added (GVA) and hours worked have changed since 2008. Output per hour worked, the ratio of output to hours worked, was 1.1% above pre-coronavirus pandemic levels in Quarter 3 (July to Sept) 2021. This is despite both GVA and hours worked remaining below levels prior to the coronavirus pandemic in Quarter 3 2021. Both GVA and hours worked were 1.4% and 2.4% below pre-pandemic levels respectively.

Figure 2: Output per hour worked was 1.1% above pre-coronavirus (COVID-19) pandemic levels

Gross value added, hours worked, output per hour worked, UK, Quarter 1 (Jan to Mar) 2008 to Quarter 3 (July to Sept) 2021

Figure 2: Output per hour worked was 1.1% above pre-coronavirus (COVID-19) pandemic levels

Gross value added, hours worked, output per hour worked, UK, Quarter 1 (Jan to Mar) 2008 to Quarter 3 (July to Sept) 2021
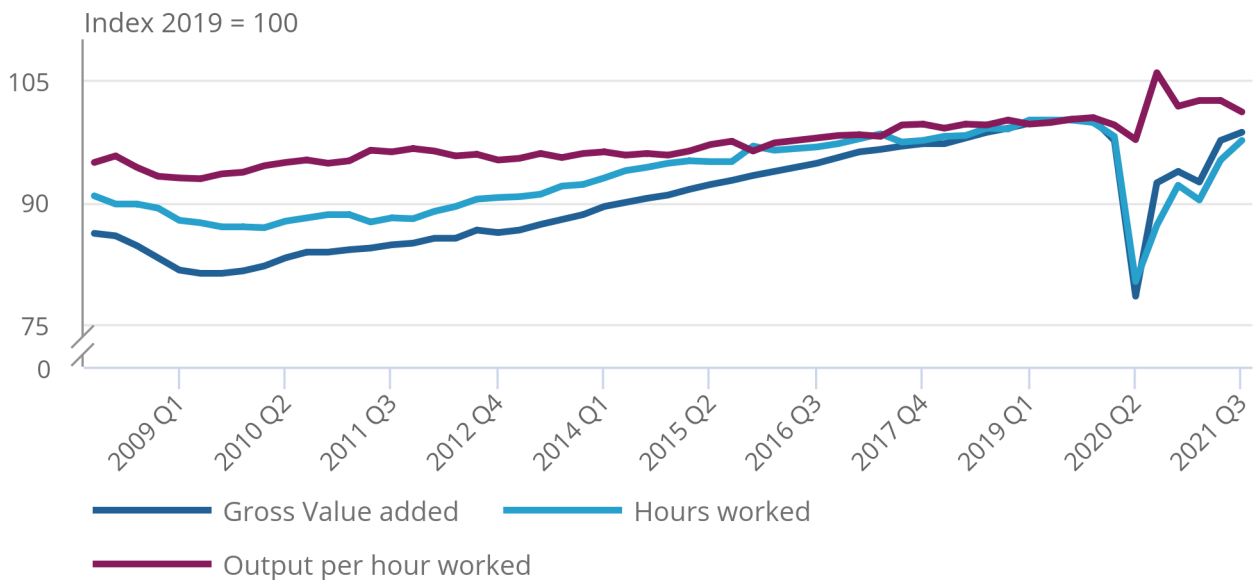
Source: Office for National Statistics – Productivity Overview, UK

4 . Labour productivity by industry

In Quarter 3 (Jul to Sept) 2021, 24 of 66 division-level industries, as defined by Standard Industrial Classification (SIC) 2007, showed growth in both gross value added (GVA) and hours worked. This is compared with the previous quarter, in line with a re-opening of the economy. However, hours worked grew more than GVA in cases such as food and beverage services, resulting in a decrease in output per hour worked.

The biggest contributors to aggregate productivity growth of 1.1%, compared with pre-coronavirus pandemic levels, were the between-industry allocation effect (0.7 percentage points) and the wholesale and retail industry (0.6 percentage points). This is likely driven by the shift to online retail during the pandemic. These were also the two largest drags on quarter-on-quarter productivity growth, as the unusual effects of the pandemic continued to unwind.

Figure 3 shows that positive contributions from both between-industry allocation effects and within-industry productivity growth supported output per hour worked to be higher than pre-pandemic levels in Quarter 3 2021. Within-industry productivity grew for the third consecutive quarter, while the between-industry allocation effect continued to shrink. Both patterns reflect the economic recovery from the pandemic and the return to work of lower productivity furloughed staff.

Contributions to cumulative output per hour worked growth versus 2019 average, decomposed into between- and within-industry effects, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2021

Figure 3: As furlough unwound, productivity moved back towards pre-coronavirus (COVID-19) levels

Contributions to cumulative output per hour worked growth versus 2019 average, decomposed into between- and within-industry effects, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2021
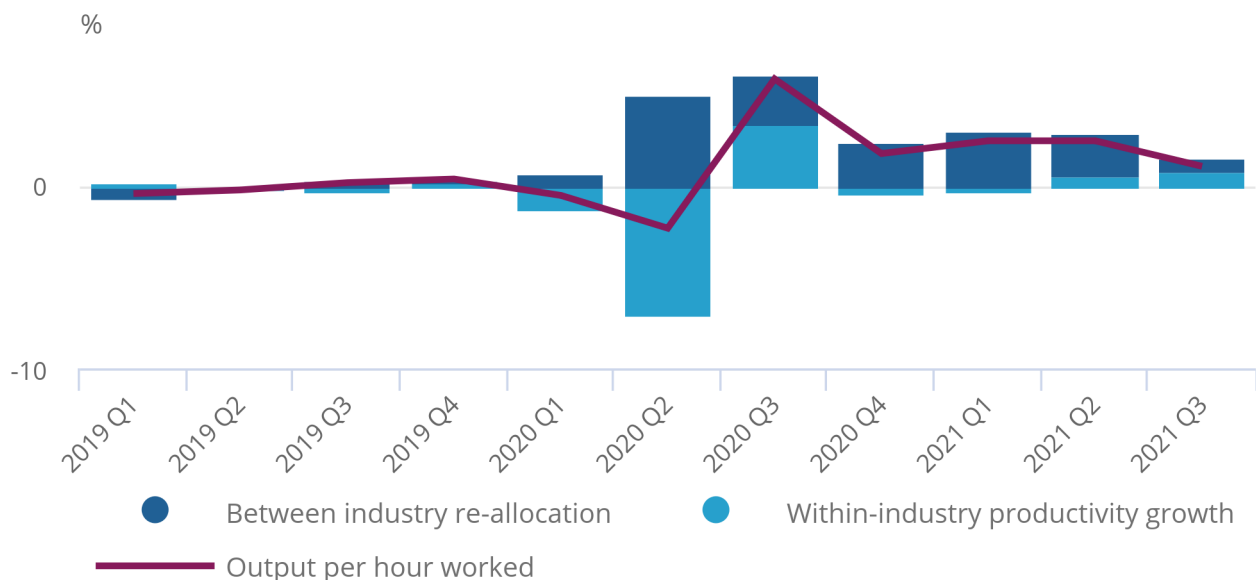
Source: Office for National Statistics – Productivity Overview, UK

Notes:

1. The allocation effect is calculated across 17 industry sections. Slightly different results may be obtained depending on the industry granularity entered into the analysis.

2. The allocation effect and growth within industries may not add up to the output per hour total. This is because of the exclusion of the National Accounts balancing value.

5 . Multi-factor productivity

Output growth in the market sector can be decomposed into growth in the factors of production. These include capital services (the amount of productive capital available to businesses), quality adjusted labour input (the number of hours worked weighted by workers' wages) and multifactor productivity (MFP) (how well inputs are used in the production process). You can find out more about these terms in the Glossary section.

Many of the factors causing a fall in gross value added (GVA) during the coronavirus pandemic were unusual and temporary in nature. However, some of the changes to economic activity might be long-lasting and affect future economic growth. Long-term negative effects from an economic downturn are referred to as "economic scarring".

Figure 4 shows the level of market sector GVA during the coronavirus pandemic compared with Quarter 4 (Oct to Dec) 2019, before the pandemic. It also shows how the measured factors of production (labour and capital) and productivity have contributed to this fall. Each of these factors are split further, to explore which effects are likely to be temporary and which could be longer-lasting.

Figure 4: Short-term economic drivers have largely recovered since the coronavirus (COVID-19) pandemic low-point, but some factors remain lower

Contribution to cumulative gross value added growth versus Quarter 4 (Oct to Dec) 2019, decomposed into various factors of production and between - and within - industry effects for multifactor productivity, Quarter 4 2019 to Quarter 3 (July to Sept) 2021

Download the data

.xlsx

The significant detraction to growth from lower average hours worked may be a short-term effect, which has recovered strongly from an initially large fall. By contrast, market sector employment grew for the first time since the start of the pandemic in Quarter 3 (July to Sept) 2021 and remains below pre-pandemic levels. Economic theory argues that lower employment rates can lead to economic scarring, especially if those losing their jobs find it hard to re-enter the workforce. If unemployed workers find it difficult to maintain or increase their skills after leaving employment, they may become less productive in future.

Lower employment in the market sector has been partially offset by higher employment in the public sector (see Figure 5) and increases in economic inactivity, rather than increases in unemployment. Economic inactivity includes the retired, students, and the long-term sick, as explored in our labour market analysis published in December 2021. Lower worker participation rates reduce available labour input, and thus limit future economic output.

Labour composition, which reflects the skills of the workforce, has increased during the pandemic. This is largely because lower skilled workers were more likely to be furloughed, causing a positive composition effect. This effect is unwinding as the number of workers on furlough falls, so it is unlikely to be a long-term positive effect. Disruption to education during the pandemic could potentially reduce the skills of the future workforce.

Capital input in Figure 4 is split into potential capital services and capital utilisation. The former represents the services that can flow from the current capital stock. These services have fallen during the pandemic, as business investment has fallen. This reduces the available capital input in future, so represents a scarring effect.

The capital utilisation measure represents how much of the available capital services are actually being used for production. Capital utilisation fell sharply during the pandemic, but this is a temporary factor, and has recovered as workers have returned to work.

Multifactor productivity (MFP) was above pre-coronavirus pandemic levels in Quarter 3 2021, as shown in Figure 1. However, as for labour productivity, this is entirely resulting from an industry composition effect. Figure 4 shows that the between-industry reallocation effect of MFP was a positive contributor to GVA growth during the pandemic, but as the economy returns to normal this is likely to subside. By contrast, within-industry MFP growth was still 0.4% below pre-pandemic levels in Quarter 3 2021, reflecting the ongoing challenges and costs of businesses producing output.

In total, long-term factors (employment, potential capital services, and within-industry MFP) were 3.4% below pre-pandemic levels in Quarter 3 2021, suggesting the potential for substantial scarring effects.

6 . Public service productivity

Public service productivity rose by 0.6% in Quarter 3 (Jul to Sept) 2021. This was a relatively modest pace compared with the 7.7% increase in the previous quarter, when the economy re-opened after a period of lockdown. Public service output fell by 1.0% in the latest quarter, while inputs fell further, by 1.5%.

The quarter-on-quarter fall in public service output in Quarter 3 2021 was mostly driven by falls in many healthcare activities and a small reduction in education activity, driven by higher absence rates. Inputs have fallen slightly in most service areas, with the exception of social protection and justice, and fire. Our estimates include ongoing methods improvements relating to non-market output for the healthcare and education services. You can find out more about these estimates in our Measuring the economic output of COVID-19 testing, tracing and vaccinations methodology. Further information is available in our Coronavirus and the impact on measures of UK government education output article.

Figure 5: Public service productivity was stable in Quarter 3 (July to Sept) 2021

Quarterly growth rates in public service output, inputs and productivity, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2021

Figure 5: Public service productivity was stable in Quarter 3 (July to Sept) 2021

Quarterly growth rates in public service output, inputs and productivity, UK, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (July to Sept) 2021

Inputs growth (inverted) — Output growth — Productivity growth
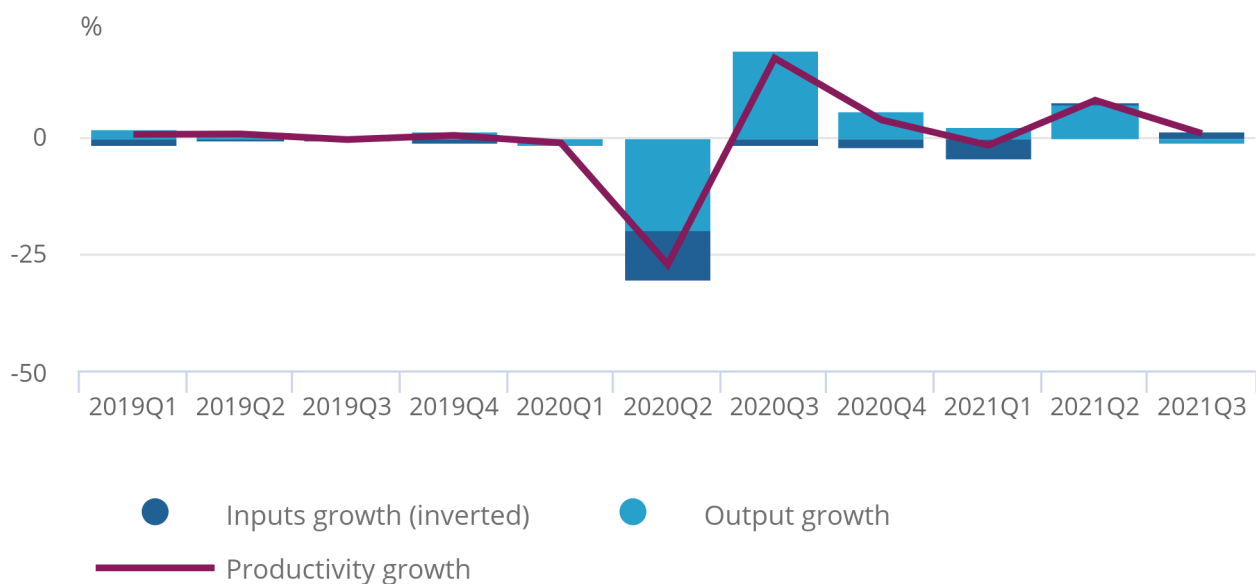
Source: Office for National Statistics - Productivity Overview, UK

Annual public service productivity is estimated to have fallen by 14.4% in 2020, in comparison with 2019. More accurate estimates at an annual level for 2020 will be published in 2023 in our annual public service productivity estimate, which is badged as a National Statistic.

7 . Developments

Unit labour cost data previously presented in this article have been moved to a new annual article and quarterly dataset release: see Labour costs and labour income.

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 ONS 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.

There is further information about NSCASE on the UK Statistics Authority's website.

8 . Data

Labour Productivity Tables 1 to 8 and R1
Dataset | Released 11 January 2022
Quarterly output per hour, output per job and output per worker for the whole UK economy and a range of industries.

Productivity jobs, productivity hours, market sector workers, market sector hours
Dataset | Released 11 January 2022
Underlying labour inputs behind the labour productivity estimates by industry and industrial sector as defined by the Standard Industrial Classification (SIC), UK.

Breakdown of contributions, whole economy and sectors
Dataset | Released 11 January 2022
Provides estimates of contributions to labour productivity, measured as output per hour (OPH), using the "Generalised Exactly Additive Decomposition" (GEAD) methodology as described in Tang and Wang (2004), UK.

Multifactor productivity estimates
Dataset MFP01 | Released 11 January 2022
Quarterly and annual growth accounting data for the UK market sector and component industries. Experimental estimates.

Public service productivity, quarterly
Dataset | Released 11 January 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.

9 . 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.

10 . Measuring the data

Revisions in this release

Data in this release are consistent with Blue Book 2021 (BB21), which implements double deflation. See our article Impact of Blue Book 2021 changes on quarterly and monthly volume estimates of gross domestic product by industry for more information about the Bluebook related changes to GVA. See our article Impact of double deflation on labour productivity: 1997 to 2018 for more information about changes to our labour productivity estimates because of BB21 changes.

New estimates of 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 gross value added and income data resulting from quarterly national accounts. Revisions to the data also reflect updates to jobs data resulting from an annual benchmarking to the Business Register and Employment Survey, and other revisions to workforce jobs estimates primarily affecting periods since 2018. 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: July to September 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 MFP and our MFP QMI.

Information on data used in public service productivity can be found in our previous release 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.

11 . Strengths and limitations

During the coronavirus 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.

More 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 QMI for the labour productivity estimates. You can view the Multifactor productivity (MFP) QMI for the MFP estimates; and the Public service productivity: total, UK QMI for the PSP estimates, with further information available in Sources and methods for public service productivity estimates.

12 . Related links

GDP quarterly national accounts, UK: July to September 2021
Bulletin | Released 22 December 2021
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 2021
Bulletin | Released 14 December 2021
Estimates of employment, unemployment, economic inactivity and other employment-related statistics for the UK.

Public service productivity: total, UK, 2018
Article | Released 14 April 2021
Updated measures of output, inputs and productivity for public services in the UK between 1997 and 2018. Includes service area breakdown, as well as impact of quality adjustment and latest revisions.

UK productivity flash estimate: July to September 2021
Article | Released 16 November 2021
Flash estimate of labour productivity for Quarter 3 (July to September) 2021 based on latest data from GDP first quarterly estimate and labour market statistics.

Unit labour costs and 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.