

Article

Labour and multi-factor productivity measures, UK: April to June 2020

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



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Correction

4 November 2020 15:28

The initial article published on 4 November 2020 used an incorrect workers figure to calculate the latest quarter's Output per Worker estimate in the text of the article. This issue did not affect the datasets, charts, or qualitative movements discussed.

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1 . Main points

- Output per hour, the UK's headline measure of labour productivity, fell by 1.8% in Quarter 2 (Apr to June 2020), compared with the same quarter a year ago.
- Output per worker fell by 21.1% over the same period; this reflects the impact of furlough schemes, which reduced hours worked but preserved workers' employment statuses.
- Output per job fell by 21% in Quarter 2 2020, relative to the same quarter a year ago; this also reflects how the “furlough scheme” has enabled people to retain their jobs whilst not working.
- Multi-factor productivity (MFP) in Quarter 2 2020 is estimated to have decreased by 13% compared with the same quarter a year ago; this is the lowest growth rate since records began.
- Productivity estimates for the current quarter (April to June 2020) are subject to more uncertainty than usual as a result of the challenges we faced in collecting labour market data and estimating gross domestic product during the coronavirus (COVID-19) pandemic.
- This release contains data that were due to be published on 7 October 2020; the data were withheld from that publication to account for the reweighting of the Labour Force Survey (LFS) following a change in methodology to adapt to data collection challenges we faced during the pandemic.

2 . Latest statistics at a glance

Table 1: Productivity Statistics for Quarter 2 (Apr to June) 2020

Series	Status	Quarter on same quarter a year ago	Quarter on previous quarter
Labour productivity			
- Output per hour	National Statistics	- 1.8	- 2.0
- Output per worker	National Statistics	- 21.1	-19.0
- Output per job	National Statistics	- 21.0	- 18.6
Multi-factor productivity	Experimental Statistics	- 13.0	- 11.0

Source: Office for National Statistics – Labour and multi-factor productivity

Notes

1. Output per hour is the headline measure of labour productivity in the UK. It is preferable to use quarter-on-same-quarter-a-year ago comparisons as productivity is a structural feature of economies and quarter-on-previous-quarter data can be distorted by short-run volatility and transition costs.

3 . Labour productivity

Productivity is a major driver of economic growth and is an important indicator of the economic health of a nation. It helps define both the scope for raising living standards and the competitiveness of an economy.

Productivity is a measure of the relationship between inputs and outputs in the economy. The fewer inputs needed to produce the same output, the more productive the economy is. Labour productivity measures the volume of gross value added (GVA) produced per unit of labour input, with hours worked as the preferred labour input.

This bulletin provides insights on productivity in the UK during the second quarter (April to June) of 2020, including the impact of the coronavirus (COVID-19). On 23 March 2020, the UK went into lockdown imposed by the national and devolved governments to slow the spread of the coronavirus pandemic. Quarter 2 started with the UK in “lockdown”, which was gradually eased as the quarter progressed and the spread of the coronavirus slowed. Therefore, this article captures most of the impact of the nationwide lockdown and the coronavirus on labour productivity.

As a result of the coronavirus pandemic, employers “furloughed” workers, meaning they remain employed without working. Furthermore, employees have had to adjust to new working conditions, such as working from home. These changes have had divergent effects on different measures of labour productivity.

Output per hour fell by 1.8%, whereas output per worker has dropped by an unprecedented 21.1%. This disparity between two measures that are usually closely aligned is because of the government’s furlough schemes. These have caused employment to stay close to pre-pandemic levels, decreasing by only 0.4% on the same quarter a year ago. However, the substantial fall in total hours worked in Quarter 2 2020 took this metric below the level observed two decades ago.

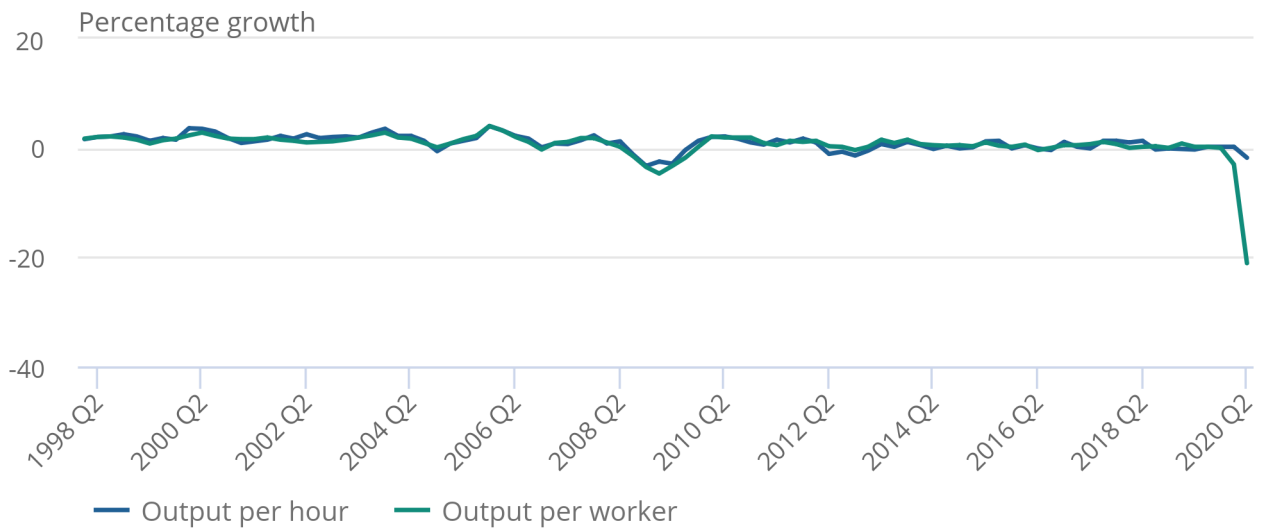
Despite that, GVA remained higher than two decades ago, and so labour productivity, as measured by output, is still higher (in level terms) than at the start of the millennium. Comparing the scale of the output per hour fall with the recent past, we can also see that the current fall is only marginally larger than that observed in Quarter 4 (Oct to Dec) 2012, when output per hour fell 1.5%, suggesting that caution should be applied before presuming the economy-wide impact of homeworking and other changes to work behaviour may be radically changing the structural nature of productivity.

Figure 1: Output per worker fell more than output per hour as hours worked fell but the number of workers was sustained by the government “furlough” schemes

Output per hour, quarter-on-same-quarter a year ago percentage growth rates, seasonally adjusted, Quarter 2 (Apr to June) 1998 to Quarter 2 2020, UK

Figure 1: Output per worker fell more than output per hour as hours worked fell but the number of workers was sustained by the government “furlough” schemes

Output per hour, quarter-on-same-quarter a year ago percentage growth rates, seasonally adjusted, Quarter 2 (Apr to June) 1998 to Quarter 2 2020, UK



Source: Office for National Statistics – Labour productivity

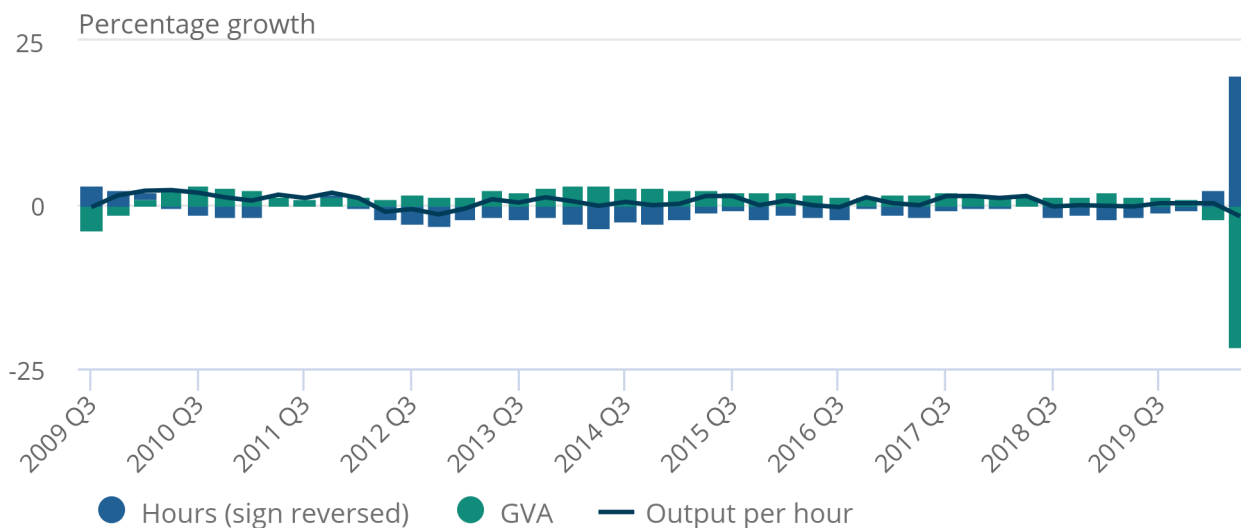
Figure 2 demonstrates why output per hour has not fallen as much as output per worker. Changes in output per hour can be decomposed into changes in output, as measured by GVA, and changes in hours. Higher GVA means more production in the economy and, holding hours constant, increases output per hour. Conversely an increase in total hours worked, holding GVA constant, reduces output per hour. The large reduction in GVA for the latest period, accompanied by a slightly smaller reduction in hours worked (the sign is reversed) has a net result of a modest reduction in output per hour compared with the same period a year ago.

Figure 2: Large falls in both gross value added and hours worked produced a modest fall in output per hour.

Whole economy output per hour, quarter-on-same-quarter a year ago percentage growth rates, seasonally adjusted, Quarter 3 (July to Sept) 2009 to Quarter 2 2020, UK

Figure 2: Large falls in both gross value added and hours worked produced a modest fall in output per hour.

Whole economy output per hour, quarter-on-same-quarter a year ago percentage growth rates, seasonally adjusted, Quarter 3 (July to Sept) 2009 to Quarter 2 2020, UK



Source: Office for National Statistics – Labour productivity

Notes:

1. Estimates of hours worked have had their sign reversed to reflect how they affect output per hour. An increase in hours worked will contribute negatively to output per hour, while a decrease in hours worked will contribute positively to output per hour.

However, although the whole economy’s overall fall in output per hour was modest, some parts of the economy experienced much larger falls. The industries affected the most among services sections of the economy saw large drops in output per hour because of lockdown, such as “accommodation and food services”, which saw a fall in output per hour of 72.2% compared with the same quarter a year ago. Furthermore, “other services”, “government services” and “transport and storage” saw falls of 21.3%, 14.0% and 12.4%, respectively. Outside of services, the manufacturing sections “transport equipment” and “textiles, wearing apparel and leather” had output per hour decreases of 34.5% and 30.9%, respectively.

Figure 3 translates these into each industry’s contribution to the whole economy fall, taking account of the relative size of each industry (so that a very small industry will have little effect on the headline estimate, even if it demonstrates a large fall). The public services industries (O, P and Q) are responsible for a significant part of the decline, contributing 2.5 percentage points (pp). “Hotels and catering” is another section of the economy that contributed significantly, negatively contributing 2.1pp. “Construction” further contributed 0.7pp to the decline.

However, many industries also showed minimal change compared with the same quarter a year before, and a few industries contributed positively towards output per hour, such as “real estate”, “water supply” and “manufacture of food products, beverages and tobacco”. These industries contributed 0.2pp each.

As well as changes within industries, we also have to take account of the relative movement of resources and prices between industries. This is captured by the allocation effect, which acted to push up the whole economy growth rate by 6.5pp, offsetting the majority of the declines observed within the individual industries themselves. In effect, this shows that less productive sections of the economy contracted more than sections with higher productivity.

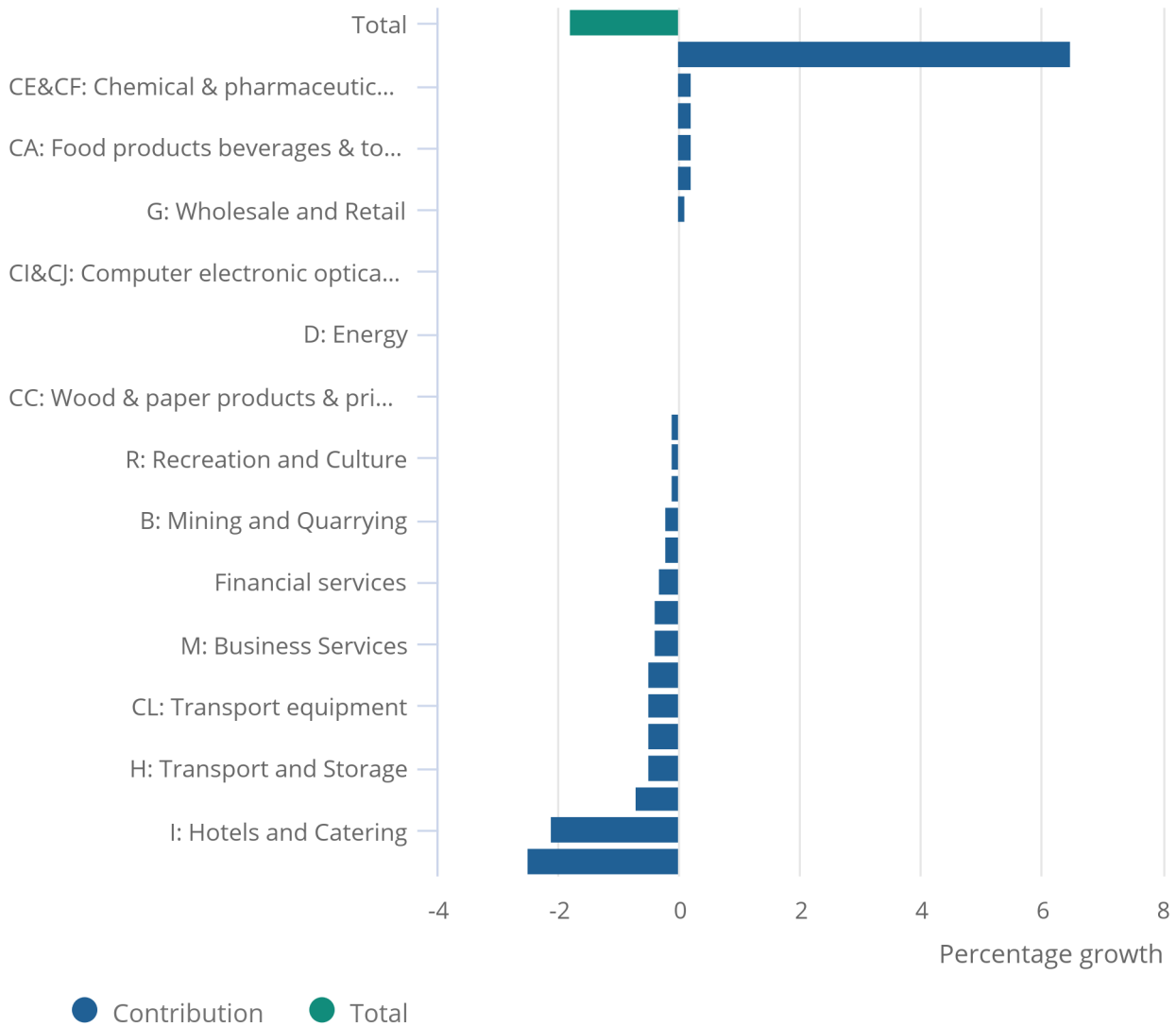
Sections such as “food and accommodation” experienced disproportionately higher levels of furlough take-up, so hours worked in these sections fell faster and reduced their share of the whole economy. The net result is that on average output per hour for the UK is pulled up, in the same way that if one removes the shortest stick from a bundle the average height of the remaining sticks goes up.

Figure 3: The allocation effect is offsetting significant declines by some sectors of the economy

Direct effect contributions to growth of whole economy output per hour, UK, year to Quarter 2 (Apr to June) 2020

Figure 3: The allocation effect is offsetting significant declines by some sectors of the economy

Direct effect contributions to growth of whole economy output per hour, UK, year to Quarter 2 (Apr to June) 2020



Source: Office for National Statistics – Labour productivity

Notes:

1. Growths can be far larger than contributions due to the relative size of the industry.

4 . Multi-factor productivity

Estimates of multi-factor productivity (MFP) provide a more nuanced view of our labour productivity estimates. MFP attempts to control for the changes in the various inputs used to create economic output and how these inputs are combined to deliver output. These inputs include changes to capital services (such as machinery and software), changes to the composition of the labour market (for example, the number of workers with university degrees) and changes to labour input in terms of hours worked. This is explained in [A simple guide to multi-factor productivity](#). MFP only covers the market sector and excludes the public sector and other similar parts of the economy.

MFP in the market sector in Quarter 2 (Apr to June) 2020 decreased by 13.0% compared with the same quarter a year ago. This is the largest fall since records began. It is also more than twice as fast as the second-largest decrease in MFP, which occurred in Quarter 2 2009, when the fall of 5.9% on the quarter a year ago reflected the effect the financial crisis had on productivity growth.

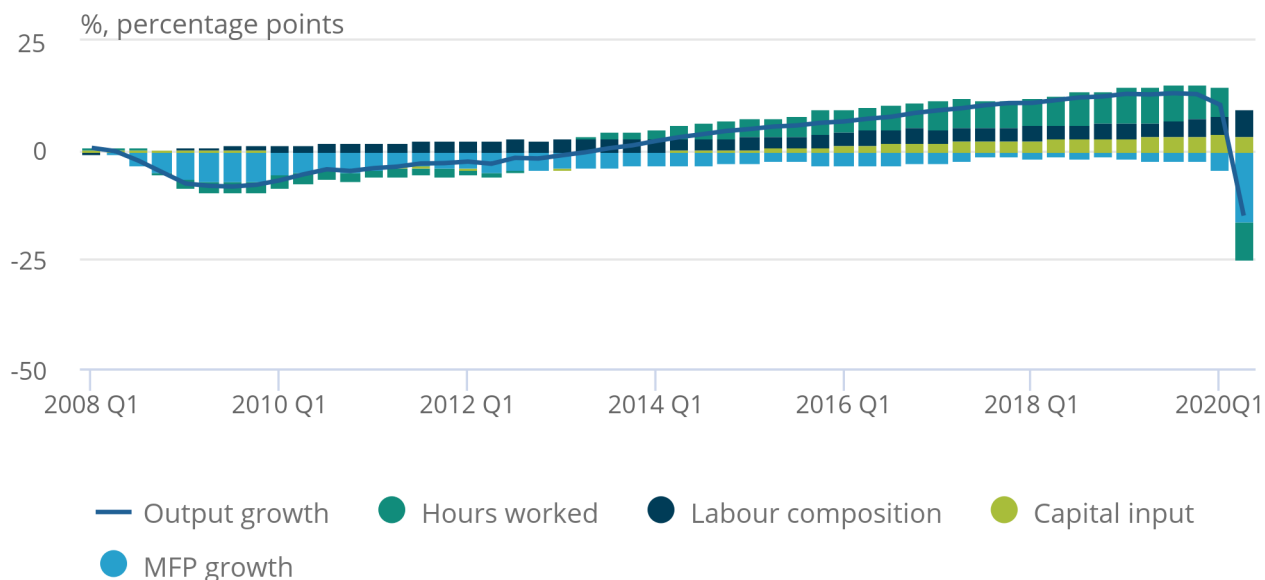
This fall coincides with the largest decrease in market sector gross value added (GVA) over the same period, decreasing by 24.2%. Figure 4 shows this fall in GVA and how changes to labour productivity are decomposed across labour and capital inputs.

Figure 4: Market sector multi-factor productivity has fallen more than any period since records began

Decomposition of cumulative quarterly output growth, Quarter 1 (Jan to Mar) 2008 to Quarter 2 (Apr to June) 2020, UK, market sector

Figure 4: Market sector multi-factor productivity has fallen more than any period since records began

Decomposition of cumulative quarterly output growth, Quarter 1 (Jan to Mar) 2008 to Quarter 2 (Apr to June) 2020, UK, market sector



Source: Office for National Statistics – Multi-factor productivity

Notes:

1. Columns show contributions of components of output growth, calculated by weighting log changes in each component by its factor income share.
2. MFP is calculated by residual.

The market sector saw a 23% decrease in hours along with the fall in GVA, although labour composition, which reflects labour capability, rose by 4.5%, suggesting those with higher qualifications may have been better able to continue working, such as through homeworking.

Capital services, the level of productive capital used in the economy, increased by 0.9%. This increase in the amount of capital used reflects the assumptions made in the calculation of these estimates, namely constant utilisation of the economy's capital stock from one period to the next. Lockdown has resulted in different patterns of capital usage across the economy: many offices and factories were empty and much of the equipment they house went unused, causing capital utilisation to fall.

This assumption therefore implies a large increase in capital deepening, which is the amount of capital workers can utilise per hour. This increase is driven by the large fall in hours worked. There is also a large fall in MFP of 13%, as noted previously.

We are therefore urgently reviewing the potential to introduce a factor into our model to allow the capital utilisation level to be adjusted to reflect such events. In Figure 5 we have attempted to provide some insight around the potential scale of the impact of this by undertaking a basic thought-experiment around the capital deepening element of the model. Figure 5 includes a “grey area”, showing the additional capital deepening in Quarter 2 2020 compared with the cumulative effect of all net capital investment since 2008. If one considers that with capital investment falling off and firms probably unable to undertake rapid capital scrapping in this period, the previous quarter’s level could be considered as a sensible baseline for capital deepening, with the figure derived with constant utilisation of capital being a “ceiling” level.

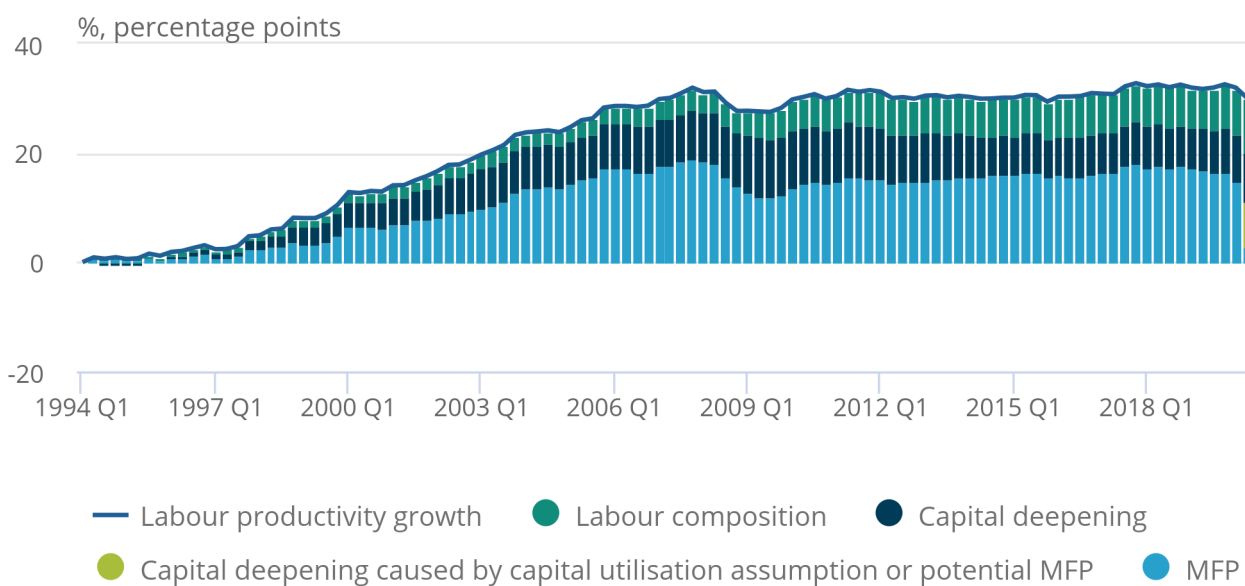
In the coming months we plan to investigate this further to better identify the true value. Any residual will be reflected back into our MFP estimate. As such, we caution users that these experimental MFP estimates may be subject to revision in future quarters. We will consult on methodology changes before making these into the experimental series, but will continue to publish analysis to inform users of our progress.

Figure 5: Uncertainty around multi-factor productivity’s contribution to market sector productivity growth

Decomposition of cumulative quarterly levels of output per hour worked, market sector, UK, Quarter 2 (Apr to June) 1994 to Quarter 2 2020

Figure 5: Uncertainty around multi-factor productivity’s contribution to market sector productivity growth

Decomposition of cumulative quarterly levels of output per hour worked, market sector, UK, Quarter 2 (Apr to June) 1994 to Quarter 2 2020



Source: Office for National Statistics – Multi-factor productivity

Notes:

1. Labour productivity growth is the cumulative quarter-on-quarter log change in market sector gross value added (GVA) per hour worked.
2. Columns show contributions of components, calculated by weighting log changes in each component by its factor income share.
3. MFP is calculated by residual.

Changes in the composition of labour have provided a counterweight to the fall in output per hour during the lockdown. The effects of furlough-related policies and the subsequent fall in the number of hours worked by those affected has been felt far more by those on lower wages, often [younger people](#) and those with lesser qualifications. These individuals are likely to be working in jobs that require fewer skills and result in lower value added to the economy. As a result of their hours falling, the proportion of hours worked by higher-paid workers has increased. This shift has resulted in the average hour worked being completed by more skilled workers.

For example, hours for the least educated workers in the market sector fell by 27.9% on the quarter versus a 8.5% decrease for the most educated. Similarly, hours fell by 23.5% for workers aged 16 to 29 years against a 18.2% decrease for workers aged 30 to 49 years (although it is notable that hours for those older than 50 years fell by a similar amount to younger workers). Part of this shift is a result of certain industries being affected by lockdown more than others. For example, businesses involved in hospitality saw much larger falls in hours than other industries, affecting younger, less educated workers, on the whole, than other groups.

5 . Labour productivity and multi-factor productivity data

[Labour productivity tables 1 to 8 and R1](#)

Dataset LPROD01| Released 4 November 2020

Estimates of main productivity metrics, corresponding to tables from the PDF version of the statistical bulletin.

[Productivity jobs, productivity hours, market sector workers, market sector hours](#)

Dataset LPROD02| Released 4 November 2020

Underlying labour inputs behind the labour productivity estimates by industry and industrial sector as defined by the Standard Industrial Classification (SIC). Contains statistics on productivity jobs, productivity hours and market sector workers. These statistics are the main intermediates in producing output per worker and output per hour statistics.

[Labour productivity by industry division](#)

Dataset | Released 4 November 2020

Contains statistics on productivity hours, output per hour and output per hour at current prices. Productivity hours measures the whole economy and sectoral hours worked. Output per hour is gross value added divided by productivity hours. Output per hour at current prices is displayed in British pounds. These are experimental statistics for the UK.

[Labour productivity: revisions triangles](#)

Dataset LPRODREV| Released 4 November 2020

Revisions triangles for the main labour productivity variables. Data present the first estimates of chosen statistics used in the labour productivity publication against later revised estimates. Includes output per worker, output per job and output per hour, first estimates and revisions.

[Labour productivity time series](#)

Dataset PRDY| Released 4 November 2020

Quarterly output per hour, output per job and output per worker for the whole UK economy and a range of industries.

[Multi-factor productivity estimates](#)

Dataset | Released on 4 November 2020

Quarterly and annual growth accounting data for the UK market sector and component industries. Experimental estimates.

6 . Glossary

Labour productivity

Labour productivity is calculated by dividing output by labour input.

Labour inputs

Labour inputs in this release are measured in terms of workers, jobs (“productivity jobs”) and hours worked (“productivity hours”).

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.

7 . Measuring the data

The measure of labour productivity output used in these statistics is the [chained volume \(real\) measure of gross value added \(GVA\) at basic prices](#).

Multi-factor productivity (MFP) estimates are compiled using the growth accounting framework, which 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](#).

The datasets accompanying this release incorporate revisions to Blue Book 2020-consistent gross domestic product (GDP) as published in [GDP quarterly national accounts, UK: April to June 2020](#); these revisions affect all time periods. Where relevant, index series are set to 2018 equals 100. Measures of labour (workers, jobs, and hours worked) are revised in line with [Vacancies and jobs in the UK: September 2020](#), and these revisions flow through into corresponding measures of productivity; revisions to labour metrics primarily affect Quarter 1 (Jan to Mar) 2020. Where applied, seasonal adjustment also revises all time periods to some extent.

8 . Strengths and limitations

Strengths and limitations of the data, and data uses and users, can be found in the appropriate Quality and Methodology Information (QMI):

- [Labour productivity QMI](#)
- [Multi-factor productivity QMI](#)

9 . Related links

[Productivity economic commentary, UK: April to June 2020](#)

Article | Released 7 October 2020

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

[Labour productivity headline measures, UK: April to June 2020](#)

Article | Released 13 October 2020

Headline estimates for UK labour productivity, including whole economy output per hour and output per worker.

[GDP quarterly national accounts, UK: April to June 2020](#)

Bulletin | Released 30 September 2020

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: September 2020](#)

Bulletin | Released 13 October 2020

Estimates of employment, unemployment, economic inactivity and other employment-related statistics for the UK.

[Subregional productivity in the UK: February 2020](#)

Article | Released 28 February 2020

The article provides estimates for sub regional labour productivity measured as gross value added (GVA) per hour worked and GVA per filled job.

[Public service productivity: total, UK, 2017](#)

Article | Released 8 January 2020

Updated measures of output, inputs and productivity for public services in the UK between 1997 and 2017. Includes service area breakdown, as well as impact of quality adjustment and latest revisions.