

Regional and subregional labour productivity

Quality and methodology information (QMI) for regional and subregional labour productivity, detailing the strengths and limitations of the data, methods used, data uses and users.

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1 . Methodology background

Statistical designation: Includes both National statistics and [Official statistics in development](#)

Frequency: annual

Geographic coverage: UK, International Territorial Level 1 (ITL1), ITL2, ITL3, Local Authority Districts, Combined Authorities and Economic Enterprise Regions

Last revised: July 2025

Related publications:

- [Regional and subregional labour productivity, UK](#)

2 . About this quality and methodology information report

This quality and methodology report contains information on the quality characteristics of the data (including the five European Statistical System quality dimensions) as well as the methods used to create them.

The information in this report will help you to:

- understand the strengths and limitations of the data
- learn about existing uses and users of the data
- understand the methods used to create the data
- help you to decide suitable uses for the data
- reduce the risk of misusing data

3 . Important points about regional and subregional labour productivity data

Labour productivity is useful in analysing the relationship between economic growth and labour over a given period. In interpreting these statistics, users should keep the following in mind.

Output per hour is our preferred measure of labour productivity because it accounts for different working patterns; it is calculated for the whole economy, regions and subregions by dividing gross value added (GVA) by the total hours worked in the corresponding area.

Output per job is calculated for the whole economy, for each region and subregion by dividing GVA by the number of jobs for that specific area. A "job" refers to a specific position of employment, which could be full-time or part-time. If a single worker holds multiple jobs, each of those positions are counted separately.

There will be some small differences between the results for the two measures. This occurs because the average of hours worked per job varies across regions and subregions because of differences in labour market structure and working patterns. For example, a region or subregion with high levels of part-time employment will tend to have lower average hours worked per job.

Output (GVA) per job does not take into consideration regional labour market structures or different working patterns, such as the mix of part-time and full-time workers, home workers and job shares. For this reason, Output (GVA) per hour worked is a more comprehensive indicator of labour productivity and the preferred measure at sub-national level.

Labour inputs come from the Labour Force Survey (LFS). The LFS provides average actual hours worked by workers used in the calculation of output per hour, total UK workers needed for Output per worker and the self-employed component of jobs. Methods relating to LFS data collection can be found in our [LFS](#).

Employee jobs and the industrial breakdown come from the Short-term Employment Survey (STES).

The quality indicators for LFS labour inputs can be found in our [A11: Labour Force Survey sampling variability dataset](#). The reliability of regional and subregional productivity estimates is dependent on both the quality of labour inputs and GVA.

Smoothed vs unsmoothed data

Unsmoothed time series data at small geographies such as ITL3 or Local Authority Districts tend to show volatility in the data that arises from the smaller survey samples inherent within estimates for smaller geographic areas. Therefore, a weighted average of up to five years has been used to remove this volatility and produce a smoothed time-series. The results are presented based on both the smoothed and unsmoothed subregional productivity data series. It should be noted that when calculating the subregional productivity data, unsmoothed data has been used at all times. The smoothing process has only been applied to the final results. For any users who would like to make use of the unsmoothed results, these data are also provided.

When using this smoothed data for time-series analysis, examining a particular year-on-year change is ineffective, because each year's data are already a weighted average of a number of different years. Therefore, to examine a year-on-year change, for example from 2022 to 2023, the only suitable method would be to use the unsmoothed data that are available in the accompanying datasets.

However, because of the volatility of the data, this year-on-year change may well be because of the volatility arising from the sample errors, as opposed to a "true" change in the data. Furthermore, in the absence of confidence intervals for the subregional productivity data, it is very difficult to determine what the case is.

In view of this, time series analysis of the subregional productivity data is better done over a longer period of time. Trends over a longer period of time are less likely to be the result of the volatility around any single year estimate and more likely to be showing a change in the economic performance of the subregion. Such a trend should show up in the smoothed data, as well as the unsmoothed data, so using the smoothed data is appropriate when considering the trend over the full data time series.

Interpreting data in index form

The regional and subregional productivity data includes tables showing GVA in chain volume measure prices (CVM), which includes adjustments for price changes (inflation-adjusted), presented as an index. This data is recommended for time-series analysis. There are also tables showing GVA in current prices (CP). Changes in the price of inputs and outputs make this measure less useful for measuring changes in productivity over time, but it can be useful for comparing productivity levels between different areas across a single year.

Note that both sets of tables use indices in some cases, but they have a different interpretation depending on whether applied to CVM prices or current prices.

When applied to chain volume measures, the index is showing the change in productivity levels relative to the base year for which the value is set at 100. So, a value of 108.0 for 2024 and a value of 100.0 for 2023 would imply an 8% increase in productivity between 2023 and 2024 for that place.

By contrast, when applied to current price data, the index shows comparisons against the UK level of productivity. For example, if an ITL1 region has a value of 102.5 in 2024, this would imply its level of productivity is 2.5% higher than the overall UK level of productivity.

Note in the case of current price data, a decrease in the productivity index number of a subregion across years does not necessarily mean that the subregion's productivity has decreased in actual terms; it means that the subregion has performed weaker than the rest of the UK over the period. In other words, its actual productivity level may have improved, but at a slower rate than the UK overall, thus declining relative to the UK=100 index. Similarly, an increase in the productivity index number means that the region or subregion has performed better than the rest of the UK.

4 . Quality summary

Overview

This report relates to the annual regional and subregional productivity statistics, details of which can be found on our [Labour productivity page](#), and for the main publications: [Regional and subregional labour productivity, UK](#).

Labour productivity is defined and described in detail with our [Labour productivity QMI](#) . Therefore only new information related to regional and subregional statistics will be provided within this QMI.

Regional productivity measures

Regional labour productivity statistics are derived by dividing output, as measured by regional GVA, by measures of labour input, namely:

- hours worked
- number of jobs

The quality of labour input data reflects the integration between two sources the LFS and STES. Further information of these sources [Quality summary](#) of our [Labour productivity QMI](#).

Regional GVA is the value generated by any unit engaged in the production of goods and services. It is measured at current basic prices, excluding taxes (less subsidies) on products. GVA plus taxes (less subsidies) on products is equivalent to gross domestic product (GDP). For more information, please see the associated [QMI](#).

The productivity data included in this methodology directly uses Blue Book 2024 consistent GVA data provided for a range of geographies. Data on regional GVA can be found in the linked [datasets](#) of our [Regional economic activity by gross domestic product, UK bulletin](#).

In interpreting trends in productivity, users need to take account of a range of factors including structural restrictions on labour adjustment, and the complex relationship between economic outputs and factor inputs. More information can be found in Chapter 10 of the Organisation for Economic Co-operation and Development's (OECD's) [Measuring Productivity Manual](#).

Uses and users

Regional productivity estimates users, uses strengths and limitations are covered within our uses and users section of our [Labour productivity QMI](#) notable exceptions include:

Timeliness

- We align our regional analysis alongside the annual release of regional GVA.

Granularity

- It is possible that the data can reflect volatility because of sampling and non-sampling errors. This is more likely where sample sizes are small, which can occur at smaller geographical areas such as ITL2, ITL3 and Local Authorities. For this reason, as mentioned in Section 3, both temporally smoothed and unsmoothed estimates are provided for current price data. For estimates of subregional productivity in CVM, only unsmoothed data series are provided to avoid multiple averaging of data as the GVA(B) data are already chain-linked.

Recent improvements

Improvements to our estimates come from improvements to source data, productivity methodology or the accessibility, clarity and interpretation of our data.

Improvements include those made to the national account data, for example, changes from the national accounts' improvement project included in the annual Blue Book improvement. There have also been changes to labour market sources, such as updated information on person weights and improvement to the labour market source data via a sample boost during the coronavirus (COVID-19) pandemic.

5 . Quality characteristics of the regional and subregional labour productivity data

This document provides a range of information that describes the quality of the data and details any points that should be noted when using the output. We have developed [Guidelines for Measuring Statistical Quality](#) that are based upon the five European Statistical System (ESS) Quality Dimensions. This document addresses these quality dimensions and other important quality characteristics, which are:

Relevance

(The degree to which statistical outputs meet users' needs.)

Regional and subregional labour productivity estimates are published by ITL1, 2 & 3 region, Combined Authorities and Economic Regions in index form (using CVM prices and a base year consistent with National Accounts) and in current prices (CP) GBP. Some selected tables are also provided for Local Authority Districts. Estimates are seasonally adjusted to allow direct comparison between periods. For subregional estimates we provide smoothed estimates to account for the underlying volatility.

We use several comparison periods to illustrate changes in productivity growth over time. We compare the latest year with:

- the previous year (year-on-year growth); this allows assessment of the most recent changes
- the value in 2019, before the COVID-19 pandemic (year-on-2019 growth); this allows the best possible assessment of changes resulting from the COVID-19 pandemic and related restrictions, that in the UK covered the period between Quarter 1 (Jan to Mar) 2020 to Quarter three (July to Sept) 2021

Accuracy and reliability

(The degree of closeness between an estimate and the true value.)

As a derived statistic, the accuracy of the productivity estimates is largely determined by the accuracy of the output and labour inputs.

Regional GVA estimates are published annually. A single balanced measure of GVA known as GVA(B) is produced by balancing two separate measures of GVA: the income measure (GVA(I)); and the production measure (GVA(P)). More information on the methods behind regional GVA can be found in its [QMI document](#).

Revisions to the productivity estimates are made in line with revisions to the output and labour inputs. Revisions to National Accounts data occur as new data become available. The [National Accounts Revisions Policy](#) provides more information about revisions to National Accounts data. Labour Force Survey (LFS) estimates are subject to revisions generated by mid-year population estimates, and every 10 years they are revised to census totals. Short-Term Employment Surveys (STES) estimates are revised annually when employee jobs are benchmarked to estimates from Business Register Employment Survey (BRES).

To maintain reliability of the productivity statistics, estimates are published at appropriate levels of aggregation and frequency.

Coherence and comparability

Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain for example, geographic level.

Regional and subregional labour productivity time series data covers the UK whole economy disaggregated by region and subregion.

Accessibility and clarity

Accessibility is the ease with which users can access the data, also reflecting the format in which the data are available, and the availability of supporting information. Clarity refers to the quality and sufficiency of the release details, illustrations, and accompanying advice.

Regional labour productivity estimates are published on our [Labour productivity webpage](#).

Our recommended format for accessible content is a combination of HTML webpages for narrative, charts and graphs, with data being provided in usable formats such as CSV and Excel. Available formats for content published on our website but not produced by us, or referenced on our website but stored elsewhere, may vary. For further information, please email productivity@ons.gov.uk.

For information regarding conditions of access to data, please refer to:

- our [Terms and conditions information webpage](#) (for data on the website)
- our [Accessibility statement for the Office for National Statistics webpage](#) (the datasets associated with this release have been modified accordingly)

Timeliness and punctuality

Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the gap between planned and actual publication dates.

The regional and subregional labour productivity annual estimates are published with a 1.5-year lag. They are published in a joint publication, our [Regional and subregional labour productivity, UK](#) article, annually.

For more details on related releases, our [Release calendar](#) is available online. In the unlikely event of a change to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change will be explained, as set out in the [Statistics Authority's Code of Practice](#) and on our [Data Policies webpage](#).

Concepts and definitions (including list of changes to definitions)

(Concepts and definitions describe the legislation governing the output and a description of the classifications used in the output.)

Regional and subregional labour productivity estimates are derived statistics, meaning they use other published data. The Office for National Statistics (ONS) National Accounts output data are governed by the conventions of the [European System of Accounts 1995 \(ESA95\)](#).

Geography

Estimates are published on a UK regional geographic basis.

Geographic coverage: UK, ITL1, ITL2, ITL3, Local Authority Districts, Combined Authorities and Economic Enterprise Regions.

This year we have adopted the 2025 update to the International Territorial Levels (ITL) geography framework. This is the first major update since the introduction of the ITL in 2021, to replace the Nomenclature of Units for Territorial Statistics (NUTS) classification following the UK leaving the European Union.

The new ITL classification is unchanged at the ITL1 level, still comprising Wales, Scotland, Northern Ireland and the nine English regions. There is also a 13th "region", called "extra-regio", which contains activity that cannot be assigned to a mainland region of the UK (North Sea oil and gas extraction, UK embassies and armed forces posted overseas).

At the ITL2 level, there are now 46 subregions (formerly 41), with new subregions in Wales, Scotland, and the North East, South West and East of England.

At the ITL3 level, there are now 182 local areas (formerly 179), with new areas in all countries and regions except Northern Ireland, the North East, East Midlands and West Midlands.

At the local authority district (LAD) level, we have updated to the 2024 boundaries, giving a total of 361 local authority districts, unitary authorities, metropolitan districts, London boroughs and Scottish Councils.

Other subregional geographies include 15 currently agreed combined authorities and 18 economic regions.

Output quality

All statistics included in our joint publication are [Official statistics in development](#).

Why you can trust our data

The labour productivity estimates are produced in accordance with the best practices set out in the [Statistics Authority's Code of Practice](#) and on our [Data Policies page](#).

Any revisions to the data are clearly identified as such and limitations are communicated, changes to data used to produce our regional and subregional labour productivity is made known to all users.

6 . Methods used to produce our regional and subregional labour productivity data

How we collect the data, main data sources and accuracy

A summary of these data sources is documented in [Section 5: Quality characteristics of the regional and subregional labour productivity data](#), under the subheading, Accuracy and reliability.

How we process the data

Regional labour productivity

For estimates of regional productivity relative to the UK, output per hour and output per job are calculated using the regional GVA in current prices and CVM broken down by regions. These are published as indices (UK=100) on an annual basis. The regional productivity estimates use GVA in current prices from the output (or production approach) and may be subject to unmeasured differences in regional prices.

The process begins by aggregating Labour Force Survey (LFS) microdata to derive estimates of hours worked and job counts, disaggregated by work region, employment status (employee, self-employed, Government Supported Trainee), and Standard Industrial Classification (SIC) section (A to T).

To address item non-response in reported hours, we apply a correction factor. Specifically, we scale up the aggregate hours using a multiplicative adjustment based on the proportion of jobs for which hours data were not reported relative to those with valid responses. This adjustment ensures that the hours estimate more accurately reflects the total workforce, compensating for missing data where individuals have indicated employment but not specified hours worked.

Average hours worked are then calculated for each employment status group, employees, self-employed, and Government Supported Trainees, by dividing the corrected aggregate hours by the corresponding job counts within the LFS data. These averages are computed separately by region, industry, and employment status, ensuring that regional and sectoral variations are captured. For Her Majesty Forces (HMF), average hours are sourced from the Ministry of Defence (MoD) annual averages, which are further benchmarked to the quarterly pattern observed in public administration and defence. Because of data limitations, HMF average hours are assumed to be constant across regions; however, regional job breakdowns for HMF are applied.

Unconstrained regional productivity job counts are then estimated by combining employees, self-employed, and Government Supported Trainees job figures from the Short-Term Employment Surveys (STES) with regional HMF job estimates from the MoD. As STES data are provided as a snapshot for the third month of each quarter, we interpolate these figures to produce mid-quarter estimates for each employment status group.

Subsequently, unconstrained productivity hours by region are calculated by multiplying the average hours by the respective productivity job estimates for each group (employees, self-employed, and Government Supported Trainees, HMF). These unconstrained estimates are then aligned with whole economy non-seasonally adjusted (NSA) totals for jobs and hours worked, as provided by the Labour Market and Households Division (LMHD). The resulting constrained NSA components are given to the subnational analysis team.

Following this, each time series, covering hours and jobs for all employment status groups, is subjected to seasonal adjustment. The seasonally adjusted series are then further constrained to match whole economy seasonally adjusted (SA) totals for jobs and hours worked, again using LMHD data.

Finally, regional GVA data are merged into the dataset, enabling the calculation of productivity estimates (output per job and output per hour worked) for Great Britain and the UK, disaggregated by region. This comprehensive approach ensures strong, regionally specific productivity metrics that are consistent with national aggregates.

Subregional labour productivity

Subregional productivity methods are very similar to those used for regional productivity. However, some of the labour market input datasets used are different.

Jobs

At the ITL1 level, data are benchmarked to the national "productivity jobs" series, which is compiled from four components:

- employee jobs
- self-employed jobs
- government-supported trainees (GST)
- members of Her Majesty's Forces

For subregional geographies, the "total jobs" data series, a workplace-based measure of jobs, is used to apportion regional productivity jobs to the local authority districts geography level. These local authority data are then aggregated to ITL2 and ITL3 subregions, enterprise and city regions to make up the full "productivity jobs" data series for subnational levels.

The "total jobs" data series comprises employees (from the Business Register and Employment Survey (BRES)), self-employment jobs (from the Annual Population Survey (APS)), government-supported trainees (from the Department for Education and Department for Work and Pensions) and HM Forces (from the Ministry of Defence).

Hours

"Productivity hours" is the sum of employee hours, self-employment hours, hours worked in government training schemes and hours worked by HM Forces.

The Annual Population Survey (APS) is used to estimate the average hours worked per employee job by industry at ITL3 subregions. The BRES (for the period since 2009) and the Annual Business Inquiry (for the period before 2009) are used to calculate the number of employee jobs by industry for each local authority. To calculate employee hours within each local authority, the local authority employee job count is multiplied by the average hours of the ITL3 for each industry.

The APS is also used to estimate the average hours worked per self-employed job. However, because of sample size, self-employed jobs are grouped by sex and part-time classification, instead of by industry, at ITL3 subregions. To calculate self-employed hours within each local authority, the local authority self-employed job count (also based on APS) is multiplied by the average hours of the ITL3 to which it belongs for each sex and part-time classification grouping.

For government training schemes and HM Forces, the regional totals are allocated to subregions based on each subregion's share of regional employee plus self-employment hours, as calculated in the previous stage.

Once calculated, these local authority data are then constrained regionally to the ITL1 productivity hours data to ensure consistency with regional productivity data. The regionally constrained local authority data are then aggregated to ITL2 and ITL3 subregions, enterprise and city regions.

How we quality assure and validate the data

A number of procedures are followed to quality assure the data. These processes are applied at all stages of the production process, at both granular and aggregate levels.

Quality assurance is carried out at all of the important stages of processing. This is followed by a larger scale quality assurance, involving ONS experts on labour market and National Accounts. This made it possible to check the accuracy of the data and the processing system simultaneously.

Visual presentations are created from the processed data. These presentations are used for internal analysis to highlight important data points or patterns that may warrant further investigation.

How we disseminate the data

A summary of these data sources is documented in [Section 5: Quality characteristics of the region and subregional labour productivity data](#) under the subheading, 'Accessibility and clarity'.

How we review and maintain the data processes

Further revisions to the estimates may be required in accordance with, for example, changes to source data. This follows our [Revisions Policy](#). Our [Guide to statistical revisions](#) is also available.

7 . Other information

Assessment of user needs and perceptions

The processes for finding out about uses and users, and their views on the statistical products.

The Productivity team is responsible for producing the regional labour productivity statistics. The team maintains a productivity mailbox (productivity@ons.gov.uk), which is an important means of engagement with productivity users. Through this medium and wider communication, we have created a user group list, which is used to consult with our users.

The subnational team is responsible for producing the subregional labour productivity statistics. The team maintains a mailbox (subnational@ons.gov.uk), which is an important means of engagement with users.

Reviewing communication from users, the most common requests are for availability of additional data, data on the intermediate series used to calculate the published estimates and the future timing of productivity releases.

As part of our user engagement strategy and at the request of main users, the Productivity and Subnational team consult with our users regularly.

8 . Related links

[European system of accounts 1995 \(ESA95\)](#)

Guidelines | Released 24 November 1999

Defines the accounting rules that are needed so that the economies of the Member States can be described in quantitative terms in a consistent reliable and comparable manner.

[Gross domestic product \(GDP\) QMI](#)

Methodology | Released 8 April 2022

Quality and Methodology Information for gross domestic product (GDP), detailing the strengths and limitations of the data, methods used and data uses and users.

[GDP output approach \(low-level aggregates\)](#)

Dataset | Released 12 May 2023

Annual and quarterly low-level aggregates of UK output gross value added (GVA) on a constant- and current-price basis.

[International Labour Organization](#)

Guidelines

Standards and guidelines on labour statistics from the International Labour Organization.

[Measuring the economy](#)

Guidelines

Chapter on productivity and why it is important.

[OECD productivity manual \(PDF, 993KB\)](#)

Manual

Measurement of aggregate and industry-level productivity growth.

[Quarterly national accounts](#)

Bulletin | Released 31 March 2023

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.

[UN system of national accounts \(SNA\) 2008](#)

Guidelines | Released 2008

Latest version of the international statistical standard for the national accounts, adopted by the United Nations Statistical Commission.

9 . Cite this quality and methodology information (QMI)

Office for National Statistics (ONS), released 21 July 2025, ONS website, methodology, [Regional and subregional labour productivity QMI](#).