Gross domestic product (GDP), UK regions and countries QMI

Quality and Methodology Information (QMI) for quarterly regional and countries gross domestic product (GDP). Includes strengths and limitations, methods and uses.

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Notice

31 July 2026

We will be introducing substantial methods and data changes to our existing quarterly regional gross domestic product (GDP) outputs. We will introduce the changes in our Update on reinstating quarterly regional GDP estimates for England and Wales article series. When we fully reinstate the output we will start a new series for statistical articles, datasets, and a quality and methodology guide.

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1 . Output information

- Survey name: Gross domestic product (GDP), UK regions and countries
- National Statistic: No, designated as experimental statistics
- Data collection: Survey and administrative data
- Frequency: Quarterly
- How compiled: Primarily administrative source; with some sources from sample-based surveys, other government departments and private organisations; further information on sources can be found in the Quarterly country and regional GDP data sources catalogue
- Geographic coverage: England, the English regions, Wales and Extra Regio - International Territorial Levels (ITL) 1 regions
- Last revised: 3 February 2023

2 . About this Quality and Methodology Information report

This Quality and Methodology Information (QMI) report contains information on the quality characteristics of the data (including the European Statistical System five dimensions of quality) as well as the methods used to create it. 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 the data

3 . Important points

- Our gross domestic product (GDP), UK regions and countries bulletin provides our most reliable quarterly estimates of regional economic activity for England, the nine English regions and Wales.
- Estimates are measured using the output approach where gross value added (GVA) is considered a proxy for GDP.
- The quarterly paths of each region by industry in the GDP, UK regions and countries publication are reconciled with the most recently published annual regional accounts estimates, which contain annual estimates of regional GDP. Regional totals are in line with annual accounts until they are updated. Otherwise, the quarterly path will be aligned to quarterly UK GDP.
- GDP estimates for Northern Ireland and Scotland are published by the Scottish Government and Northern Ireland Statistics and Research Agency (NISRA).
- Data for GDP estimates are sourced mainly from HM Revenue and Customs (HMRC) Value Added Tax (VAT) administrative sources, along with other sources where VAT is not appropriate (for example, the financial industry).
- Data are available dating back to 2012 on a quarterly and annual basis.
- Estimates are available in chained volume measures, with the effect of inflation removed.
- As we do not currently produce regional price deflators, the regional GDP data are estimated using the latest UK deflators available each quarter, consistent with the UK quarterly estimates of GDP.

4 . Quality summary

Overview

The annual regional accounts provide our most comprehensive estimates of regional activity, but these are currently produced with a delay of approximately 12 months and estimates for the latest year are provisional. The quarterly gross domestic product (GDP), UK regions and countries bulletin provides more timely and more frequent estimates, consistent with both the annual regional accounts and national accounts.

These are our most reliable high-frequency estimates of regional economic activity, which show the rates of changes in GDP by industry and region for England and its regions and Wales.

Northern Ireland and Scotland GDP estimates are compiled by the devolved administrations and are not directly used in the process to estimate the GDP, UK regions and countries bulletin. However, these quarterly indicators are conceptually in line with how UK GDP is estimated in the UK National Accounts.

The quarterly GDP bulletin for the nine English regions and Wales is primarily based on Value Added Tax (VAT) estimates of turnover, which capture the returns of 1.9 million businesses. VAT is one of the many inputs that feed into compiling the UK National Accounts, including UK GDP.

There is a trade-off in the production of regional estimates of economic activity, since there are constraints on producing timely, high-frequency and granular regional estimates.

Our Subnational economic activity statistics: user guide covers how our sub-national publications are compiled and reconciled, and recommends how and when these different regional estimates should be used.

The GDP, UK regions and countries data have been published as experimental statistics since September 2019. Being experimental has allowed us more flexibility in improving the methods while publishing data required for the economy. The Office for Statistics Regulation (OSR) are reviewing the data against the Code of Practice for Statistics. Our plan and recommendations to move to National Statistics status will be published by the OSR in due course.

Users and uses

The regional accounts allow comparison between the countries and regions of the UK and provide information about the relative importance of different industries to regional economies.

A number of government departments and other bodies use the quarterly regional GDP data to analyse changing economic trends. This includes the devolved administrations, HM Treasury (HMT), local governments and authorities including the Greater London Authority, business and research communities, media and the general public.

Recent improvements

Prior to the Blue Book 2021, current prices and volume estimates of GDP (output approach) were produced independently. As part of the Blue Book September 2021 (BB21), there are now more coherent estimates of industry-level gross value added (GVA) since the supply use table (SUT) framework was expanded to current prices and previous years' prices. This means that monthly and quarterly industry data in Blue Book 2021 and beyond is now benchmarked to these new annual volume estimates, in the same way that current prices are benchmarked.

5 . Quality characteristics of quarterly regional gross domestic product (GDP)

The following subsections provide a range of information that describe the quality and characteristics of the data and identify issues that should be noted when using the output.

We have developed Guidelines for Measuring Statistical Quality based upon the five European Statistical System (ESS) quality dimensions. These quality dimensions are:

- relevance
- accuracy and reliability
- timeliness and punctuality
- accessibility and clarity
- coherence and comparability

Relevance

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

Increasing devolution of powers to countries, cities and regions of the UK brings with it increasing demand for subnational statistics to monitor the economy. The Bean Review (2016) made various recommendations on the need for regional economic statistics in the face of growing devolution, including the need for:

- more timely regional statistics
- greater flexibility to provide statistics for different geographic areas
- greater use of administrative data sources in regional statistics

In response to this, since 5 September 2019, the Office for National Statistics (ONS) has produced country and regional volume estimates of gross domestic product (GDP), with additional granular industry-level information for Wales and the nine English regions. These estimates make use of Value Added Tax (VAT) returns for 1.9 million business units available for use in official statistics, to show the economic performance at a regional level. These estimates complement the annual estimates of regional GDP that are currently available, but are produced faster and on a quarterly basis.

Our estimates of quarterly regional GDP are frequently used to answer questions on regional economic change from external stakeholders, other government departments and internal ONS departments.

Accuracy and reliability

(The accuracy is the degree of closeness between an estimate and the true value, reliability is often used as an indirect measure of accuracy. The purpose of these is to allow users to estimate their confidence in the statistics and avoid the common pitfalls in interpreting data.)

All estimates, by definition, are subject to statistical uncertainty and for many well-established statistics, we measure and publish the sampling error and non-sampling error associated with the estimate. This is used as an indicator of accuracy.

Since sampling is typically done to determine the characteristics of a whole population, the difference between the sample and population values is considered a sampling error. Non-sampling errors are a result of deviations from the true value that are not a function of the sample chosen, including systematic errors.

Estimates of GDP, including our quarterly regional estimates, are constructed in a complex way from a wide variety of data sources, many of which do not have measured sampling or non-sampling errors available. Consequently, it is very difficult to measure the impact of both types of error on GDP. Like all other G7 national statistical institutes, we do not publish a measure of the sampling error or non-sampling error associated with GDP. However, development work continues on these difficult issues.

One part of measuring accuracy is reliability, which is measured using evidence from analyses of revisions to assess the closeness of early estimates to subsequently estimated values.

Revisions are an inevitable consequence of the trade-off between timeliness and accuracy. It is our role to produce the best possible estimate of GDP using all available information at that time. Therefore, there are only two ways to avoid subsequent revisions to GDP as more information becomes available. The first would be to delay publication until all the relevant information has been received, which could be up to three years after the reference period. The second would be to publish a first estimate and then ignore any subsequent new data and any methodological improvements. So, revisions should be treated as generally positive, as long as we document the reasons for them and communicate this to users.

The balance between necessary revisions and revisions for minor issues is achieved through our National Accounts Revisions Policy. The results of revisions analysis are presented in our GDP, UK regions and countries bulletins within the revisions triangles datasets.

More information and analysis on the revisions to GDP can be found in our GDP revisions in Blue Book: 2021 article.

Accuracy of the short-term estimates of GDP growth can be affected by response rates to important surveys. If a lower response rate than normal is received, then there is a decrease in the information base of the estimate in the short-term, and this may possibly lead to an increased chance of revisions in subsequent estimates of GDP.

The 2016 Independent Review of UK Economic Statistics (PDF, 5.1MB) provides a thorough discussion of accuracy and quality in economic statistics, as well as recommendations for future development.

We are continually working on the methodological changes to improve the accuracy of the national accounts.

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.)

The GDP, UK regions and countries bulletin allows quarterly comparisons between the countries and regions of the UK and provides information about regional economic diversity and the relative importance of different industries to regional economies. The quarterly paths of industries by region in GDP, UK regions and countries are benchmarked to the most recent publication of annual regional accounts.

We work closely with the Scottish Government and the Northern Ireland Statistics and Research Agency (NISRA) to ensure our methods and estimates of GDP are consistent with their own. Data published in the statistical bulletins of the quarterly GDP, UK regions and countries publication are also consistent with:

- annual regional accounts
- UK gross value added (GVA) at current prices and 2-digit Standard Industrial Classification (SIC)
- UK GVA total industry in chained volume measures for the tail of the timeseries, where there is no current annual regional accounts data available

The only inconsistencies occur when more timely monthly releases introduce revisions in advance of their incorporation into the later quarterly publications. For example, data are not always consistent with trade in goods as our UK trade bulletin contains more up-to-date quarterly data.

Please note, in the new approach of the Blue Book 2021, balanced estimates of GVA now account for both the outputs produced and inputs consumed by the industry. There are also some coverage differences given the use of the Annual Business Survey in their compilation. As a result, GVA estimates published in the GDP releases will be different from the construction output release. Previous experimental analysis showed that the construction sector has a relatively high level of intermediate consumption and was more likely to be affected by double deflation.

Inconsistencies with the public sector accounts releases are also possible because of the different revisions policies being applied to these releases.

Another important aspect is the coherence between the three different approaches to the measurement of GDP, which are theoretically equal. However, since they are measured independently, statistical and measurement errors will mean that this is not the case. These issues also formed a major part of the 2008 article Monitoring the quality of the National Accounts (PDF, 338 KB).

Every effort is made to ensure that the data series is comparable over time, and a comparable time series is available back to Quarter 1 (Jan to Mar) 2012. Where possible, changes to methodology are applied to the whole series, to ensure this comparability is maintained. However, the National Accounts revision statements may mean that this is not possible.

Accessibility and clarity

(Accessibility is the ease with which users are able to 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.)

Our recommended format for accessible content is a combination of HTML web pages for narrative, charts and graphs, with data being provided in usable formats such as CSV and Excel workbooks. Our website also offers users the option to download the narrative in PDF format. In some instances, other software may be used, or may be available on request. 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 see the contact details on this report.

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

- ONS terms and conditions web page
- National Archives copyright and reuse of published data web page
- UK Statistics Authority pre-release access web page

In addition to this Quality and Methodology Information report, basic quality information relevant to each release is available in our accompanying GDP, UK regions and countries statistical bulletin. Advance notice of any forthcoming major changes in methodology for the GDP estimates can be found under National Accounts methodology and articles.

Since September 2022, all of our datasets available for download meet outlined accessibility standards, as legislated in 2020.

Timeliness and punctuality

Our regional GDP estimates are produced on a quarterly basis. Because of the use of Value Added Tax (VAT) data, our regional statistics are currently available with a lag of around three quarters. Work is ongoing to improve the timeliness of our estimates.

Our release calendar provides notice of our forthcoming release dates. 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 fully at the same time, as set out in the Code of Practice for Statistics.

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.)

In the UK National Accounts, GDP is measured by the output, income and expenditure approaches. For early estimates of GDP, we lead on the output approach, where gross value added (GVA) is considered a proxy for GDP. GVA is equal to output minus intermediate consumption, thereby capturing the goods and services that are used up in the production process.

Regional activity can be measured as GVA or GDP. However, the changes in GVA and GDP are not the same, with the quarterly change in GVA aligned to be within a tolerance of the quarterly change in GDP in years that have been fully balanced. More detail can be found in our guide to interpreting monthly gross domestic product. Our industry-level estimates of regional activity refer to GVA, not GDP. It is only in the annual regional accounts publication where there are any estimates of regional GDP. This is then reflected in how we produce these quarterly estimates of regional GVA, including how these are constrained to our UK headline estimates of GVA.

Regional GDP estimates are compiled using the UK Standard Industrial Classification 2007 (SIC 2007). This was used for the first time in Blue Book 2011, replacing the previously used Standard Industrial Classification 2003. The introduction of SIC 2007 for GDP estimates was in keeping with EU regulations and adapted the classifications to changes in the structure of the economy. For further information on the introduction of SIC 2007, see the Economic & Labour Market Review Implementation of Standard Industrial Classification 2007: December 2009 update article (PDF, 122KB).

6 . Methods used to produce gross domestic product (GDP) data

Main data sources

Our quarterly regional gross domestic product (GDP) statistics are derived from Value Added Tax (VAT) turnover data, business survey data and other external data sources. A comprehensive list of data sources can be found in our Regional GDP data sources catalogue.

In the national accounts, business survey information and external data sources are the primary data source for short-term estimates of GDP. Office for National Statistics (ONS) surveys are subjected to extensive quality assurance and are designed to produce good quality estimates of GDP at the level at which we publish.

In order to improve quality further, some of the survey information for smaller businesses is replaced by VAT turnover information.

As an administrative data source, the VAT turnover information has the benefit of holding information on every VAT-registered business in the UK, meaning the VAT data do not have sampling error. However, the VAT data contain an unquantified non-sampling error; to reduce this, our VAT data are quality assured before final estimates of regional GDP are produced. Non-sampling error is further reduced by benchmarking estimates to annual regional accounts and constraining to UK GDP by industry.

As we only have information at the UK level for many industries, we need a method to regionalise the data to ensure they accurately represent the regions they are measuring. Regionalising survey information, however, can be problematic, since the surveys we conduct are not designed to give regional estimates of GDP. This can lead to results that are of lower quality than the national estimates and potentially misleading for those looking to the estimates as a signal of economic performance within a region. For this reason, most industries covered by these estimates will be based entirely on VAT turnover information, meaning each region will have complete coverage and no sampling error, allowing for more accurate measures of regional GDP. Non-sampling error is reduced by detailed quality assurance, benchmarking to annual regional accounts and constraining to UK GDP by industry.

Regionalisation

Regional estimates of GDP are regionalised using the Inter-Departmental Business Register (IDBR) for businesses where there is no single site. The IDBR is the main sampling frame for business surveys in the ONS, also providing information on the employment and structure of every business, site and workplace in the UK. This allows us to apportion the VAT turnover for each business based on its employment share within any region. Difficulty in ensuring turnover is apportioned by business share accurately may lead to a loss of accuracy within the estimates. However, in instances where this method may be less reliable, for example, within the financial industry where there is often large turnover and relatively low employment, alternative data sources are used where possible to ensure estimates are representative of the regions they are measuring.

Industry classification

The regionalisation of the VAT turnover data means our dataset consists of modelled turnover values for each site or workplace in the UK. This gives us a choice as to how we classify the turnover to an industry or activity, either based on the activity of the site or based on the activity of the overall business.

As a stylised example, take a large retail chain that operates a bank in a region. The activity of the overall business would be retail, but the activity of the site would be in finance. Therefore, the turnover generated by the bank could be classified as either retail or finance. If applied to all businesses, the industry estimates derived from the data would likely be different depending on the classification used.

Regional estimates of GDP are based on the activity of the site, helping users understand the economic activity taking place within their region. This is in line with the approach taken within our annual regional accounts estimates, but differs slightly to short-term estimates of economic activity published by Scotland (Quarterly Scottish GDP) and Northern Ireland (Composite Economic Index). These are based on a hybrid industry classification between the site-level activity and the overall business activity. As the overall business and the site are usually the same, the actual difference between the two classifications is likely to be small.

Constraining quarterly current price data to national totals by industry

We constrain the regions by industry at current prices to quarterly UK gross value added (GVA) at current prices by two-digit Standard Industrial Classification (SIC) industries from Quarter 1 (Jan to Mar) 2012.

Since Blue Book 2021, ONS publishes GDP(o) current prices consistent with the chain volume measure (CVM) in our GDP output approach – low-level aggregates dataset. Annual totals are in line with regional accounts until they are updated. Otherwise, the quarterly path will be aligned to UK GDP. The benefits of this method include:

- constraining at current prices allows us to align with national totals by industry from 2012 onwards
- reliance on automated balancing tools has been minimised at chained volume measures

Calculation of all regions of the UK using consistent methodology and data sources

We calculate the GDP of Scotland and Northern Ireland using data and methodology consistent with the nine English regions and Wales (primarily VAT). Although we do not intend to publish ONS estimates for Scotland and Northern Ireland, we have collaborated with the Scottish Government and the Northern Ireland Statistics and Research Agency (NISRA) on data sources to enhance these regional estimates and will continue this work. The benefits of this method include:

- greater consistency, creating a complete matrix of UK regions by industry using the same VAT-based methodology
- the ability to compare regions with the devolved administrations' outputs and identify where we can make future improvements

Reconciliation to national totals at volume measure

We use automated balancing to constrain to UK quarterly GVA total industry at CVM for the period at the end of the timeseries in which current annual regional accounts data are not available. The automated balancing model works to minimise changes to growths in industry regions, while ensuring we are consistent with the national totals.

Deflation

Regional GDP estimates are deflated using deflators from the output approach to measuring GDP (GDPO).

Seasonal adjustment

Our quarterly regional GDP estimates are seasonally adjusted. Seasonal adjustment is the process of removing from a time series the variations associated with the time of year, or the arrangement of the calendar.

How we quality assure and validate the data

These data are subject to many layers of vigorous quality assurance, from clarity and confirmation of individual unit data direct from the business contact to scrutiny of data at the macro level. Other sources of data include other government departments and administrative data, including VAT data from HM Revenue and Customs (HMRC), which are subject to quality checks and challenges from us. By comparing and contrasting these different sources, the national accounts produce a single picture of the economy that is consistent, coherent and fully integrated.

How we disseminate the data

Our GDP, UK regions and countries bulletin shows the quarterly economic activity within England, the nine English regions (North East, North West, Yorkshire and The Humber, East Midlands, West Midlands, East of England, London, South East, and South West) and Wales.

Revisions to the data

We resumed publishing revisions on 1 September for the regions. These were larger than usual since we updated our methodology, but we publish revisions triangles alongside our releases to make any changes to our data clear to users.

Every quarter, users could expect revisions to arise, although these would generally be expected to be small in scale. Revisions could occur when:

- UK GDP revise their estimates; UK GDP are open for revisions every quarter as set out in the National Accounts Revisions Policy
- revisions are made to the HMRC VAT input data, for example, late tax returns will lead to revisions within the data
- revisions are made to the data we receive for the non-VAT data sources used in the calculation of regional GDP estimates; a full list of data sources is included in our Quarterly country and regional GDP – data source catalogue

Twice a year, revisions could also come from these additional factors and may be larger in magnitude and could cause revisions to the time series back to 2012:

- aligning the Regional GDP estimates with the latest Blue Book-consistent annual regional accounts published estimates
- aligning to the latest Blue Book UK GDP national estimates in order to ensure and improve accuracy of our statistics
- revising our estimates as a result of our annual seasonal adjustment review

The timing of future annual regional accounts releases is likely to change in future years, therefore, the quarter we expect to implement these will change accordingly.

7 . Other information

Data processing

A series of statistical techniques are applied to our data to arrive at our final estimates. These include deflation (removing the effect of prices), seasonal adjustment and constraining (see Methods used to produce gross domestic product (GDP) data section). Deflation is carried out using national level deflators, as regional price information is currently not available.

Products

Quarterly regional GDP estimates will be provided as seasonally adjusted chained volume measures (with the effect of price changes removed), broken down by broad industry grouping (20 categories) in the form of indices and growth rates. In addition to the data tables, a statistical bulletin will be made available, highlighting the most interesting features of the dataset. Revisions to previous releases are provided in revisions triangles datasets.

8 . Cite this methodology

Office for National Statistics (ONS), released 3 February 2023, ONS website, methodology, Gross domestic product (GDP), UK regions and countries QMI