

Article

GDP, English regions and Wales revisions: February 2023

Revisions to the quarterly gross domestic product (GDP) estimates for the nine English regions and Wales following methodological improvements in these Experimental Statistics.

Contact:
Keith Barnes
regionalgdp@ons.gov.uk
+44 1633 456630

Release date:
6 February 2023

Next release:
To be announced

Table of contents

1. [Main points](#)
2. [Overview](#)
3. [Methodological improvements](#)
4. [Regular revision process](#)
5. [Revisions](#)
6. [GDP, English regions and Wales data](#)
7. [Future developments](#)
8. [Related links](#)
9. [Cite this article](#)

1 . Main points

- We have used a new method of constraining to national totals in the quarterly country and regional gross domestic product (GDP) estimates and data have been constrained to the most recent publication of the Blue Book 2022 to align with the quarterly national accounts.
- These improvements have caused revisions to previous estimates of GDP for the English regions and Wales.
- This article provides details of the new methodology and analysis of the revisions between estimates produced using the old methodology and the latest estimates produced using the new methodology.

These estimates are designated as Experimental Statistics as they are still in development and should be interpreted with caution. As our data sources and methodology improve, users should expect to see revisions to our estimates. Regional data can be volatile and quarterly movements should be considered alongside the long-term trend.

2 . Overview

Revisions are a normal part of the statistical production process, for example, as more or improved source data becomes available, or improvements are made to methodology.

In recent releases of our [quarterly country and regional gross domestic product \(GDP\)](#), revisions to estimates have been larger than would usually be expected for two reasons.

The first reason is because we have used new methods of constraining to national totals. This one-off change to the methodology has been introduced to increase coherence with national estimates of GDP and reduce revisions volatility. These changes were introduced in a reduced data release published on 1 September 2022 in our [GDP, UK regions and countries: October to December 2021 bulletin](#).

The second reason is because of alignment to the most recent Blue Book. This process is carried out annually, although this year it had a larger impact than usual. This was because of the lower level constraining the new methodology had introduced and the fact that alignment with quarterly national accounts (which usually takes place each quarter) had been paused during the methodology redevelopment. This was introduced in data published on 17 November 2022 in our [GDP, UK regions and countries: January to March 2022 bulletin](#).

The changes were introduced in sequential releases rather than at the same time to help users distinguish the impact of the new methodology from the impact of the alignment. However, for some regions the revisions occurring from alignment balanced out the revisions seen from the new methodology, therefore reducing the overall revision seen when comparing with data before these changes.

Data volatility and revisions will continue to be monitored as the new methodology becomes more established. Ongoing revisions to these quarterly regional GDP estimates should be expected as part of the regular process as more data become available and the estimates are aligned to national and regional accounts. Users should be aware that the revisions when aligning to annual regional accounts or Blue Book each year, are likely to be larger than revisions seen in other quarters of the year.

The next annual regional accounts update is expected in spring 2023 and subject to timing we would expect to see these revisions in our May 2023 publication. Blue Book updates are generally released in the autumn and subject to timing we would normally expect to see these revisions in our November publication. A more detailed timeline of expected revisions can be found in [Section 4: Regular revision process](#).

3 . Methodological improvements

As part of our ongoing commitment to continuously improve the accuracy and reliability of our statistics, the Office for National Statistics (ONS) undertook a full methodology review of our quarterly country and regional gross domestic product (GDP) estimates.

National and quarterly country and regional estimates of GDP are derived from the best source of data available for that purpose, which means there are differences in the national and sub-national sources. This sometimes results in a lack of coherence between national and sub-national estimates if the data sources do not show the same movements. Added to this the previous methodology for our quarterly country and regional GDP estimates were heavily reliant on automated balancing which led to frequent process, rather than data driven, revisions to estimates and contributed to volatility in the estimates.

We introduced these statistics in response to one of the strategic findings in [Sir Charlie Bean's Independent Review of UK Economic Statistics](#) and have continued to develop them. The Office for Statistics Regulation (OSR) published their [interim findings of their assessment of these regional GDP statistics](#) on 30 January 2023.

The initial findings recognised that we have addressed one of the main themes in Bean's report of the need to improve the coverage and timeliness of sub-national estimates, and engaged well with users of quarterly regional GDP statistics. Their findings highlighted similar concerns over economic coherence with other local information, and the use of automated balancing, both of which this new methodology aims to address. As a result of these ongoing developments, the OSR have paused their assessment into considering National Statistics status for these statistics while the new methodology becomes established, and users become familiar with it.

The new methodology developed aims to reduce revision volatility each quarter and improve coherence with the national data, however, initially implementing the methodology resulted in more sizeable revisions than usual.

Subsequently, data published on 1 September 2022 in our [GDP, UK regions and countries: October to December 2021 bulletin](#) were produced using the improved method of constraining to national GDP totals. This release incorporated a reduced version of the data, providing GDP estimates by region but not by industry. The industry breakdown was reintroduced in data published on 17 November 2022 using the new methodology and aligned with the latest Blue Book.

This section provides an overview of the methodology changes that have been implemented, and the benefits of these changes. Full details of the methodology are given in our [Quality and Methodology Information report](#). Details of the previous constraining method used to estimate quarterly country and regional GDP are provided in our [Introducing GDP for the countries of the UK and the regions of England methodology](#).

Calculation of regional GDP estimates

Our previous method calculated estimates for the nine English regions, Wales, and extra-regio for each industry region. We used the published total industry figures from Scottish Government and Northern Ireland Statistics and Research Agency (NISRA) for Scotland and Northern Ireland. These estimates were only constrained to UK GDP estimates at total UK level.

Our new method calculates estimates for all 12 regions and countries at International Territorial Level 1 (ITL1) using consistent methodology and data sources. This allows the regional estimates to be constrained to UK GDP estimates at industry level.

The benefits of our new method are:

- we can produce a complete set of UK regions and countries at ITL1 level by industry using the same methodology
- it allows the regional estimates to be constrained to UK GDP estimates at two-digit Standard Industrial Classification (SIC) level
- we can compare our figures with devolved administrations' outputs to identify future improvements

While we calculate estimates for Scotland and Northern Ireland as part of our processing, we do not publish these. For Scotland and Northern Ireland users should refer to the estimates published by the [Scottish Government](#) and [NISRA](#) respectively using their own methodology and source data.

Constraining to quarterly UK GDP at current prices

Our previous method benchmarked our estimates to the latest annual regional accounts, then used automated balancing where there was no annual regional data available, to constrain to total UK GDP. The automated balancing worked to minimise changes to growths, while ensuring the quarterly regional estimates were constrained to total UK GDP. Once the estimates were benchmarked to the annual regional data, the underlying input data was dictating the quarterly movements, introducing volatility.

Our new method constrains the industry regions at current prices, to quarterly UK GDP at two-digit SIC industries from Quarter 1 (Jan to Mar) 2012. Regional GDP estimates will continue to be benchmarked to the latest annual regional accounts. We also continue to use automated balancing where there is no annual regional data available to constrain the regional estimates to total UK GDP.

The benefits of our new method are:

- constraining at current prices allows constraining from 2012
- reliance on automated balancing is reduced as the data are already constrained to the national figures at the lower industry level
- constraining in current prices reduces the revisions as the quarterly movements at the lower industry level will follow UK GDP
- there is greater coherence between the national and sub-national estimates which are aiming to measure the same concepts

Information on the production of regional statistics can be found in our [Subnational economic activity statistics: user guide](#).

4 . Regular revision process

The revisions introduced in our [GDP, UK regions and countries: January to March 2022 bulletin](#) (released on 17 November 2022) were mainly attributed to revisions caused by constraining to the most recent publication of the Blue Book 2022 consistent quarterly national accounts, published on 30 September 2022.

Further details on Blue Book 2022 revisions to the quarterly national accounts can be found in the relevant section of our [GDP quarterly national accounts, UK bulletin](#) (released on 30 September 2022). As a result of these expected changes to UK gross domestic product (GDP), the release on 1 September 2022 of GDP, UK regions and countries incorporated a reduced version of the data, providing GDP estimates by region but not by industry.

As a summary, every quarter users could expect revisions to arise for the following reasons, although these would generally be expected to be small in scale:

- UK GDP are open for revisions every quarter as set out in the [National Accounts Revisions Policy](#), we will expect revisions to our data every time UK GDP revise their estimates
- we can also be affected by revisions to the HM Revenue and Customs (HMRC) value added tax (VAT) input data, for example late tax returns will lead to revisions within the data
- revisions made to the data we receive for the non-VAT data sources used in the calculation of regional GDP estimates, will lead to revisions within the data; 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 size 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 (likely to be the May release)
- aligning to the latest Blue Book UK GDP national estimates (likely to be the November release)
- in order to ensure and improve accuracy of our statistics, estimates could revise as a result of our annual [seasonal adjustment](#) review (likely to be the November release)

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.

We plan to incorporate revisions into our upcoming releases throughout 2023 as follows.

GDP, UK regions and countries: April to June 2022

This publication will be published on 9 February 2023. The first period being revised is Quarter 1 (Jan to Mar) 2021.

The expected causes of revisions are:

- revisions to UK GDP
- revisions to underlying input data (VAT and non-VAT data sources)

GDP, UK regions and countries: July to September 2022

This publication is due to be published in May 2023 (provisional). It is fully open for revision.

The expected causes of revisions are:

- benchmarking to new Blue Book 2022-consistent annual regional accounts up to 2021
- revisions to UK GDP
- revisions to underlying input data (VAT and non-VAT data sources)

These estimates will be consistent with the annual regional accounts and the UK National Accounts. For future years the timing of when these will be consistent will depend on when both regional and national accounts (Blue Book) are published.

GDP, UK regions and countries: October to December 2022

This publication is due to be published in August 2023 (provisional). The first period being revised is Quarter 1 2022.

The expected causes of revisions are:

- revisions to UK GDP
- revisions to underlying input data (VAT and non-VAT data sources)

GDP, UK regions and countries: January to March 2023

This publication is due to be published in November 2023 (provisional). It is fully open for revision.

The expected causes of revisions are:

- revisions to UK GDP from Blue Book 2023
- seasonal adjustment review
- revisions to underlying input data (VAT and non-VAT data sources)

5 . Revisions

Revisions by country and region

One of the main causes of revisions seen in recent releases of our quarterly country and regional gross domestic product (GDP) estimates was the new method of constraining. This methods change has caused the largest revisions over the periods affected by the coronavirus (COVID-19) pandemic.

In most periods while there are small differences, the data sources used for national and sub-national statistics often move in similar ways. However, the significant changes seen during the coronavirus pandemic made it a difficult time for statistical data measurement. For some industries this resulted in different patterns in the sub-national data sources we use, when compared with the national accounts data sources. Therefore, it resulted in more substantial data revisions over the periods affected by the coronavirus pandemic when the new method of constraining was initially implemented.

Figure 1 shows the revisions seen at total industry level between:

- the estimates produced using the old methodology, in our [GDP, UK regions and countries: July to September 2021 bulletin](#) (released 31 May 2022)
- the estimates produced using the new methodology, [GDP, UK regions and countries: October to December 2021 bulletin](#) (released 1 September 2022)
- the latest estimates after alignment with the most recent Blue Book, in our [GDP, UK regions and countries: January to March 2022 bulletin](#) (released 17 November 2022)

Figure 1: Revisions to total industry quarterly gross domestic product (GDP) growth for the English regions and Wales

Seasonally adjusted quarter on previous quarter GDP growth, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar), Q2 refers to Quarter 2 (Apr to Jun), Q3 refers to Quarter 3 (July to Sept), and Q4 refers to Quarter 4 (Oct to Dec).

Download the data

[.xlsx](#)

For some regions the revisions occurring from alignment to the Blue Book in the November 2022 estimates counteracted the revisions seen from the new methodology in the September 2022 estimates, therefore reducing the overall revision seen when comparing with data before these changes. For example, in the West Midlands in Quarter 3 (July to Sept) 2020 the quarter-on-quarter growth was first estimated to be 16.8%. It was then revised up to 21.6% following the implementation of the new methodology in the September 2022 estimates, before being revised back down to 19.6% in the November 2022 estimates after alignment to the Blue Book.

Revisions by industry

Our release published on 1 September 2022 provided GDP estimates by region but not by industry. Therefore, this section does not provide analysis of these estimates.

The causes for the revisions seen for each region at total industry level (shown in Figure 1) can be attributed to revisions in a number of industries, with the causes differing across the industries. This section provides further analysis for a selection of regions that experienced large revisions, detailing the specific industries or sectors contributing to the revisions.

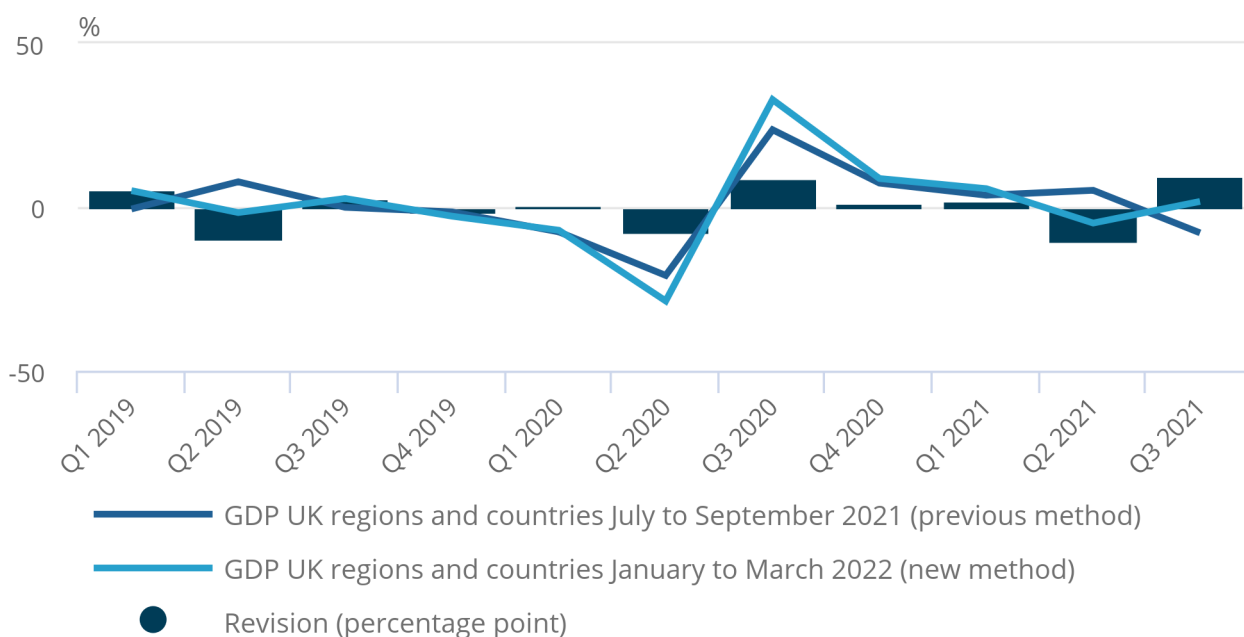
As the size of industries vary between regions, revisions for a particular industry may affect each region to differing extents depending on how dominant an industry is within that region's economy.

Figure 2: The largest revision for the manufacturing industry in the North East was in Quarter 2 (Apr to June) 2021 at negative 10 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for the North East comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021

Figure 2: The largest revision for the manufacturing industry in the North East was in Quarter 2 (Apr to June) 2021 at negative 10 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for the North East comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021



Source: Office for National Statistics – GDP, English regions and Wales revisions

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar), Q2 refers to Quarter 2 (Apr to Jun), Q3 refers to Quarter 3 (July to Sept), and Q4 refers to Quarter 4 (Oct to Dec).

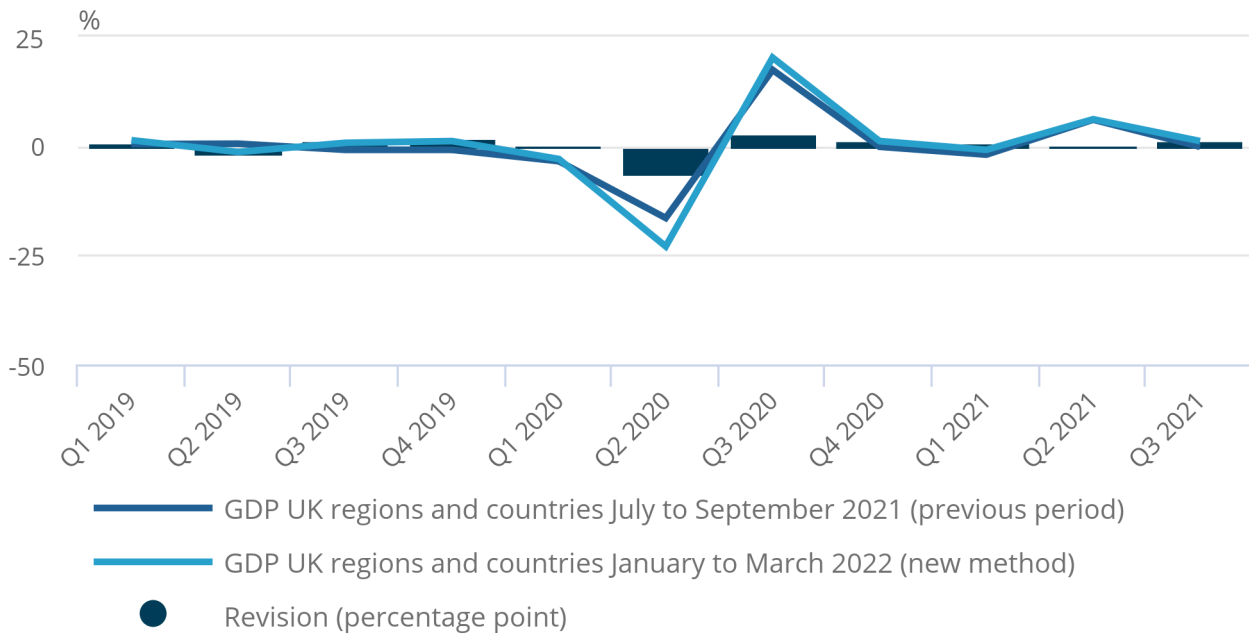
In the North East, the manufacturing sector made a large contribution to the overall revision for this region, given it is one of the dominant industries in this region (shown in Figure 2). These revisions are caused by a combination of the seasonal adjustment review and the implementation of our new constraining method.

Figure 3: The largest revision for the total service industries in the East Midlands was in Quarter 2 (Apr to June) 2020 at negative 6.5 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for the East Midlands comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021

Figure 3: The largest revision for the total service industries in the East Midlands was in Quarter 2 (Apr to June) 2020 at negative 6.5 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for the East Midlands comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021



Source: Office for National Statistics – GDP, English regions and Wales revisions

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar), Q2 refers to Quarter 2 (Apr to Jun), Q3 refers to Quarter 3 (July to Sept), and Q4 refers to Quarter 4 (Oct to Dec).

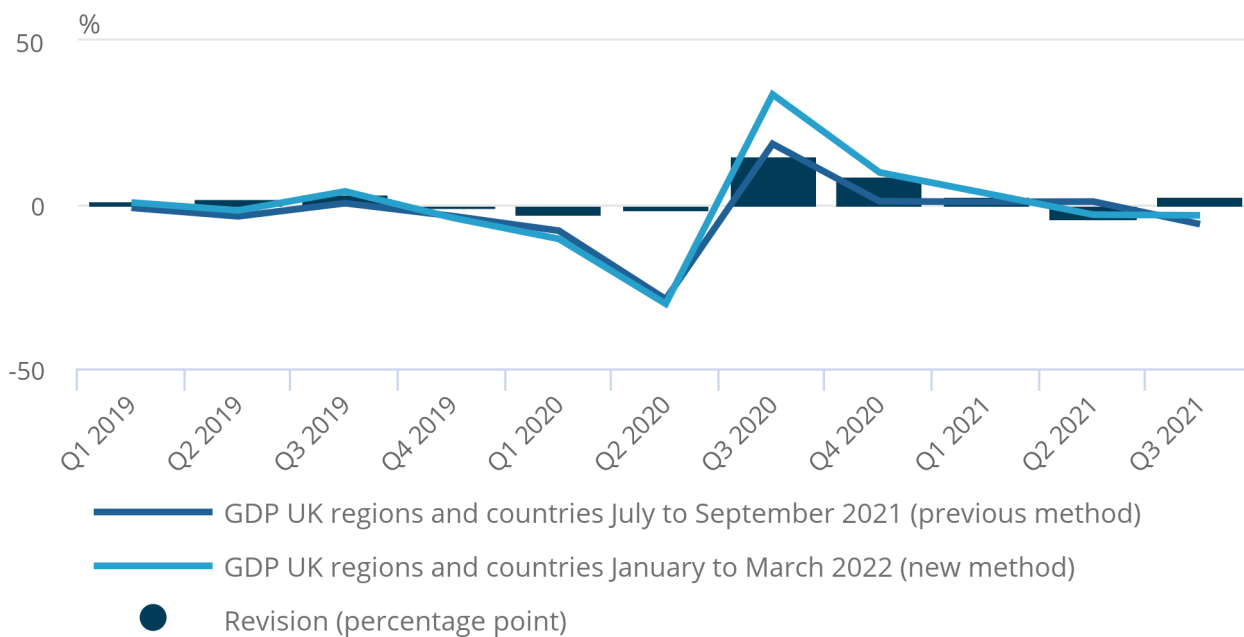
The total revisions seen in the East Midlands were dominated by the services sector, with the quarter-on-quarter growth estimates in Quarter 2 (Apr to June) 2020 revised down by 6.5 percentage points, as shown in Figure 3. This was mainly caused by the new method of constraining to the national totals, with the largest contribution to this change being from the human health and social work sector, closely followed by the education sector.

Figure 4: The largest revision for the manufacturing sector in the West Midlands was in Quarter 3 (Jul to Sept) 2020 at 15.1 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for the West Midlands comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021

Figure 4: The largest revision for the manufacturing sector in the West Midlands was in Quarter 3 (Jul to Sept) 2020 at 15.1 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for the West Midlands comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021



Source: Office for National Statistics – GDP, English regions and Wales revisions

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar), Q2 refers to Quarter 2 (Apr to Jun), Q3 refers to Quarter 3 (July to Sept), and Q4 refers to Quarter 4 (Oct to Dec).

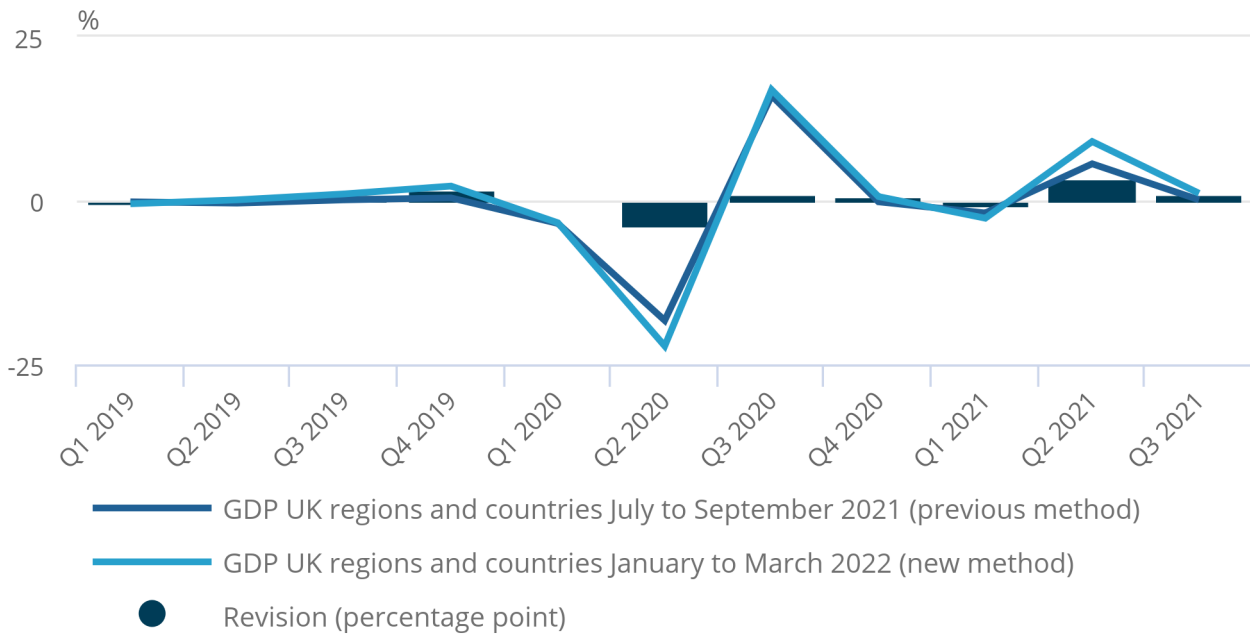
In the West Midlands the manufacturing sector was one of the largest contributors to revisions in Quarter 3 2020 and Quarter 4 (Oct to Dec) 2020, as shown in Figure 4. These revisions were caused by the seasonal adjustment review and the implementation of the new method of constraining to the national totals.

Figure 5: The largest revision for the total service industries in the West Midlands was in Quarter 2 (Apr to June) 2020 at negative 3.9 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for the West Midlands comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021

Figure 5: The largest revision for the total service industries in the West Midlands was in Quarter 2 (Apr to June) 2020 at negative 3.9 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for the West Midlands comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021



Source: Office for National Statistics – GDP, English regions and Wales revisions

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar), Q2 refers to Quarter 2 (Apr to Jun), Q3 refers to Quarter 3 (July to Sept), and Q4 refers to Quarter 4 (Oct to Dec).

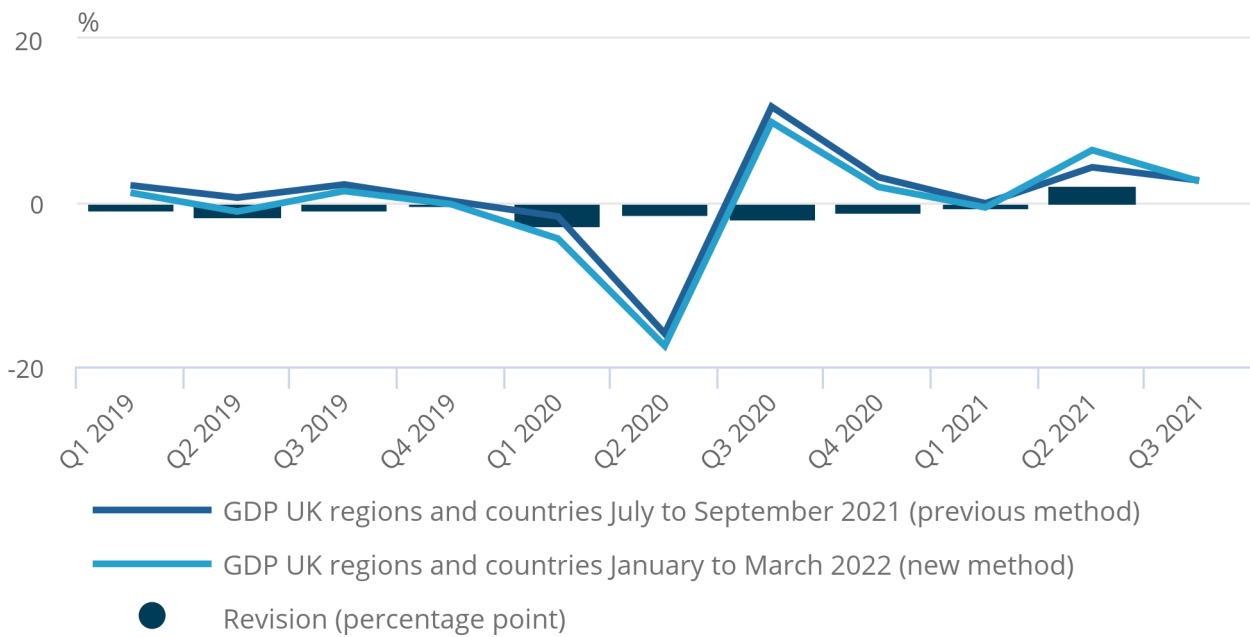
Revisions in the West Midlands were also evident in the total service industries, shown in Figure 5. The West Midlands saw downward revisions in Quarter 2 2020 and upward revisions in Quarter 2 2021 in the human health and social work sector and the education sector. This was a result of the implementation of the new method of constraining to the national totals.

Figure 6: The largest revision for the total service industries in London was in Quarter 1 (Jan to Mar) 2020 at negative 2.7 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for London, comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021

Figure 6: The largest revision for the total service industries in London was in Quarter 1 (Jan to Mar) 2020 at negative 2.7 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for London, comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021



Source: Office for National Statistics – GDP, English regions and Wales revisions

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar), Q2 refers to Quarter 2 (Apr to Jun), Q3 refers to Quarter 3 (July to Sept), and Q4 refers to Quarter 4 (Oct to Dec).

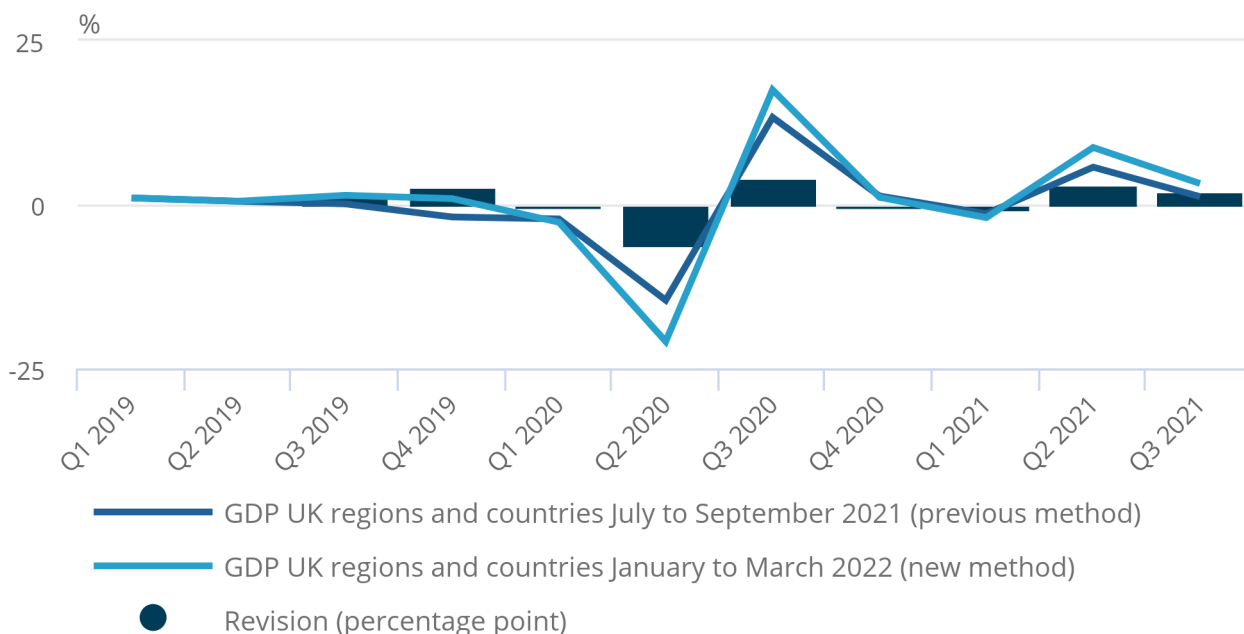
The largest revision in the total service industries in London was in Quarter 1 2020. This was caused by a revision of negative 12.7 percentage points in the real estate sector, as a result of revisions to the input data used to calculate these estimates. Furthermore, the upward revision in Quarter 2 2021 for the total service industries (Figure 6), is mainly caused by the implementation of the new methodology revising the estimates for human health and social work activities in London.

Figure 7: The largest revision for the total service industries in Wales was in Quarter 2 (Apr to June) 2020 at negative 6.3 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for Wales, comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021

Figure 7: The largest revision for the total service industries in Wales was in Quarter 2 (Apr to June) 2020 at negative 6.3 percentage points

Seasonally adjusted quarter on quarter gross domestic product (GDP) for Wales, comparing old and new methodology, Quarter 1 (Jan to Mar) 2019 to Quarter 3 (Jul to Sept) 2021



Source: Office for National Statistics – GDP, English regions and Wales revisions

Notes:

1. Q1 refers to Quarter 1 (Jan to Mar), Q2 refers to Quarter 2 (Apr to Jun), Q3 refers to Quarter 3 (July to Sept), and Q4 refers to Quarter 4 (Oct to Dec).

For Wales, the largest revisions were seen in the service industries as a result of the methodology changes. Figure 7 shows the revision in the total service industries for Wales when comparing the 31 May 2022 estimates with the 17 November 2022 estimates. The human health and social work sector provided the largest contribution to the downward revision in growth for Wales in Quarter 2 2020. There was a negative change in estimates of 19.0 percentage points for this quarter caused by the new method of constraining to the national totals.

Published alongside this article is a dataset comparing all the revisions seen for each industry by region or country when comparing between the estimates produced using the old methodology, [GDP, UK regions and countries: July to September 2021](#) (released on 31 May 2022) and the latest estimates produced using the new method of constraining to national totals, [GDP, UK regions and countries: January to March 2022](#) (released on 17 November 2022).

6 . GDP, English regions and Wales data

[GDP, English regions and Wales industry revisions comparison](#)

Dataset | Released 6 February 2023

Comparison of quarterly country and regional GDP estimates by industry and region from our latest published timeseries, compiled using the new methodology of constraining to national totals against previously published estimates compiled using the old methodology.

7 . Future developments

Upcoming releases

The next release of GDP, UK regions and countries, for April to June 2022 is scheduled to be published on 9 February 2023. Subsequent releases are provisionally scheduled for May, August and November 2023, these will be published on the [Office for National Statistics release calendar](#) once finalised.

Our [Gross domestic product \(GDP\), UK regions and countries QMI report](#) provides users with further information on the quality of these estimates and the methodology used.

Development

We will continue to monitor the impact of this new methodology, ensuring the methodology we continue to use are fit for purpose. We will also address the recommendations highlighted in the [interim findings from the Office for Statistics Regulation \(OSR\) assessment](#) in advance of restarting the OSR assessment into becoming [National Statistics](#).

With the updated data sources, and real-world effects on the data, we will continue to review and monitor the outputs as more information becomes available.

These data are designated as [Experimental Statistics](#). These are statistics that are in the testing phase. We will continue to develop these statistics and seek users' views on their uses and needs for these data. We welcome feedback to help inform our development work at regionalgdp@ons.gov.uk.

8 . Related links

[GDP monthly estimate, UK: November 2022](#)

Bulletin | Released 13 January 2023

Gross domestic product (GDP) measures the value of goods and services produced in the UK.

[Regional economic activity by gross domestic product, UK: 1998 to 2020](#)

Bulletin | Released 30 May 2022

Annual estimates of economic activity by UK country, region and local area using gross domestic product (GDP). Estimates are available in current market prices and in chained volume measures and include a full industry breakdown of balanced regional gross value added (GVA(B)).

[Scottish Government GDP Quarterly National Accounts: 2022 Quarter 3 \(July to September\)](#)

Statistical publication | Released 1 February 2023

This publication includes Gross domestic product (GDP) for Scotland produced by the Scottish Government.

[Northern Ireland Composite Economic Index \(NICEI\)](#)

Release | Released 12 January 2023

The NICEI is an experimental quarterly measure of the performance of the Northern Ireland economy based on available official statistics.

[Welsh Government Short-term output indicators: July to September 2022](#)

Release | Released 26 January 2023

Data showing the short-term movements in the output of industries in the production, construction, and market services sectors in Wales.

9 . Cite this article

Office for National Statistics (ONS), released 6 February 2023, ONS website, article, [GDP, English regions and Wales revisions](#)