

An Experimental Statistics Publication for Scotland

ECONOMY AND LABOUR MARKET

GDP Monthly Estimate, Scotland

December 2021

23 February 2022

Gross Domestic Product (GDP) statistics measure the output of the economy in Scotland. These monthly estimates have been developed to help track the economic impact of the COVID-19 pandemic. These are designated as **experimental official statistics**. This means that they are still in development but have been released to enable their use at an early stage. All results are provisional and subject to relatively high levels of uncertainty.

Main Findings

- Scotland's onshore GDP is estimated to have fallen by 0.4% in December. Output remains above the pre-pandemic level of February 2020 by 0.1%.
- Using the experimental monthly statistics for Quarter 4 as a whole (October to December), GDP is provisionally estimated to have grown by 1.3% compared to Quarter 3.
- Annual GDP is provisionally estimated to have grown by 7.0% in 2021, following the contraction of 10.0% in 2020.
- Output in the services sector, which accounts for around three quarters of the economy, was flat (0.0% growth) in December. At the broad level, output in consumer facing services fell by 2.5% in December, while health, education and public services output increased by 0.9%, and output in all other services increased by 0.3%.
- Output in the production sector, which accounts for around 16% of the economy, fell by 3.3% in December. Output fell in three of the four subsectors, including a contraction of 3.4% in manufacturing. Output in the construction sector, which accounts for around 6% of the economy is estimated to have grown by 1.9% in December.

Important Information About This Release

Estimates of monthly GDP growth are inherently more volatile than quarterly or annual growth. In normal times it would be sensible to concentrate on the smoother rolling quarterly growth rate (latest three months compared to previous three months). However, due to the ongoing impacts of the coronavirus pandemic, results are mostly presented in terms of monthly growth rates, or the cumulative change compared to pre-pandemic levels in February 2020.

All results are seasonally adjusted and presented in real terms (adjusted to remove inflation), and relate to Scotland's onshore economy (which does not include offshore oil and gas extraction).

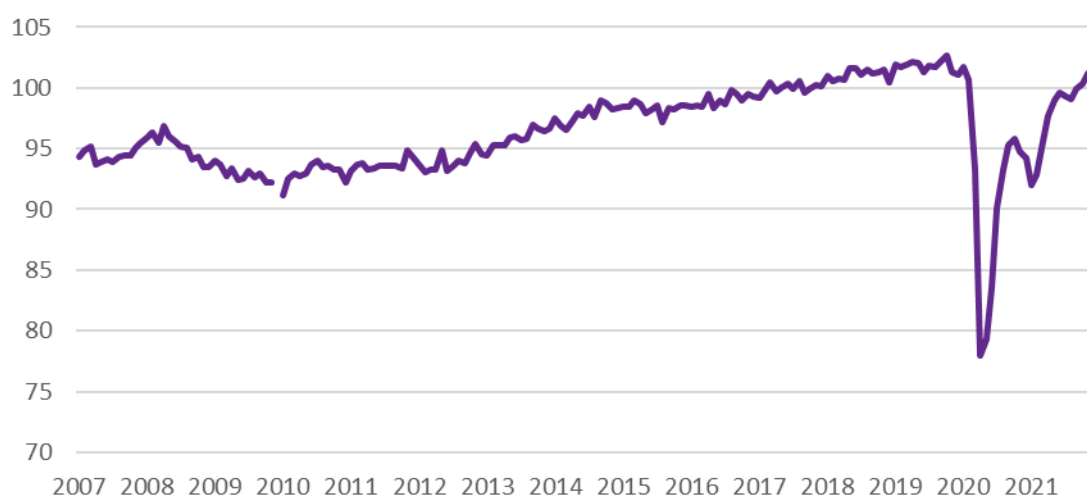
GDP fell by 0.4% in December, and is now 0.1% above pre-pandemic levels

Scotland's onshore GDP (which does not include offshore oil and gas extraction) is estimated to have contracted by 0.4% in December, with falls in consumer facing services and the production sector partially offset by growth in construction and the other parts of the services sector. This is the first fall in monthly GDP since August after three consecutive monthly increases.

In December, output is estimated to be 0.1% above the level in February 2020, prior to the direct impacts of the COVID-19 pandemic, having surpassed that level for the first time in November. The level of GDP in November is now estimated to be slightly lower than in the previous release after taking on revisions from the Quarterly National Accounts back to the start of 2020, however the general pattern of lockdowns and recovery remains broadly unchanged.

Monthly GDP Index, January 2007 to December 2021

Chained volume measure, 2017=100



Notes:

- (1) Monthly estimates begin in 2010. Results for 2007-2009 are an illustrative path based on quarterly GDP.
- (2) Users are advised to be mindful that the axis on this chart does not start at zero.

Since the start of the Covid-19 pandemic the path of Scotland's GDP has been broadly similar to the pattern seen across the UK as a whole, with unprecedented reductions in output during 2020 and early 2021 largely determined by the social distancing and health protection measures which have been applied in similar ways across the UK. [The latest ONS estimate of monthly GDP for the UK](#) shows a fall of 0.2% in December, with UK GDP at the same level as February 2020.

Since June 2020 there have been differences in the way restrictions have been applied across different parts of the UK, including the use of regional measures within Scotland. There are particularly high levels of statistical uncertainty in some of the estimates at this time. Users should be aware that revisions are likely to be made as more data become available over the coming months and quarters.

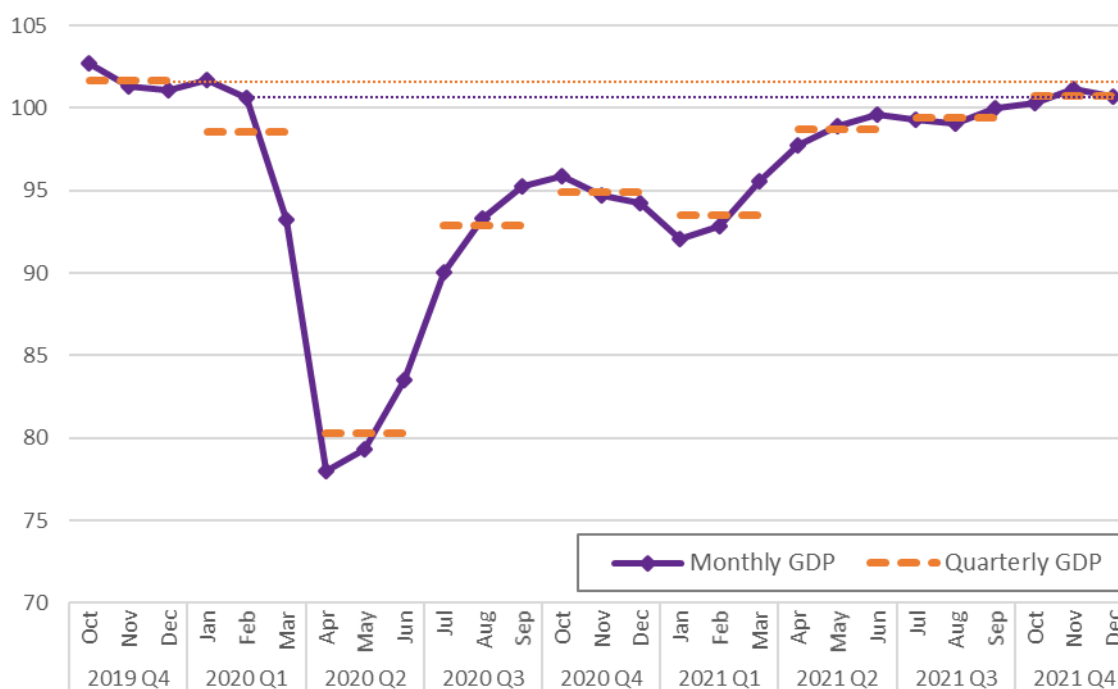
Quarterly GDP is provisionally estimated to have grown by 1.3% in Quarter 4

On a quarterly basis, comparing the whole of Quarter 4 (October to December) to Quarter 3 (July to September), GDP is provisionally estimated to have grown by 1.3%. This reflects an increase in growth after the slowdown to 0.7% seen over the summer months. In quarterly terms output is now 0.9% below the pre-pandemic level in 2019 Quarter 4.

The growth in Quarter 4 was broad based, with increases in each of the production, construction and services sectors. In services, total output increased by 1.4% during the quarter, with the largest positive growth rates continuing to be seen in some of the consumer facing subsectors which had been most severely affected by the restrictions in place during the lockdown period at the start of the year.

Total output in the production sector is estimated to have increased by 0.8% during quarter 4. There was a strong rebound of 7.8% in electricity and gas supply following lower levels of electricity generation in the summer. This more than offset a fall of 1.3% in manufacturing. Output in the construction sector is provisionally estimated to have grown in line with the UK as a whole by 1.0%.

Comparison of Quarterly and Monthly GDP with pre-pandemic levels Chained volume measure, 2017=100



Notes: (1) Users are advised to be mindful that the axis on this chart does not start at zero.

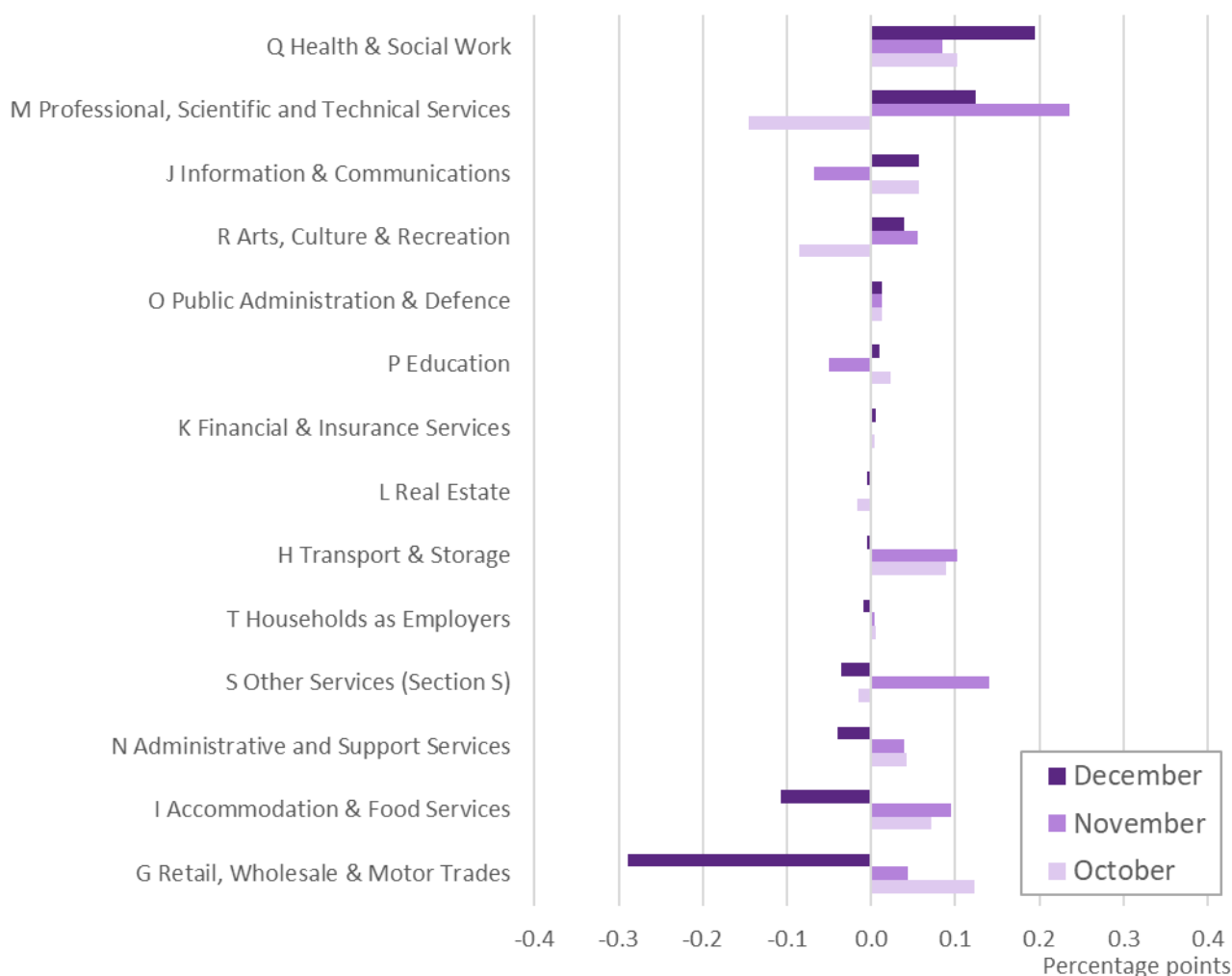
The results for quarterly GDP presented in this release are based on the monthly estimates and are experimental official statistics. The GDP Quarterly First Estimate (National Statistics) will be published on 16 March, and the results for all months in October to December could be revised at that time when the more detailed and comprehensive estimates are available.

Services sector

Output in the services sector, which accounts for around three quarters of the economy, was flat (0.0% growth) in December, with increases in seven of the fourteen subsectors. Services output is now 1.3% above the level in February 2020 prior to the direct impacts of the COVID-19 pandemic.

Within services, the largest positive contribution to growth in December was from the Health & Social Work subsector, with an increase of 1.8% reflecting higher levels of test and trace and vaccination activity in response to the Omicron variant of COVID-19. There was also a strong contribution to growth from the 1.9% increase in professional, scientific and technical services.

Services Sector Contributions to GDP Monthly Growth: October to December 2021 Percentage points by SIC 2007 industry section

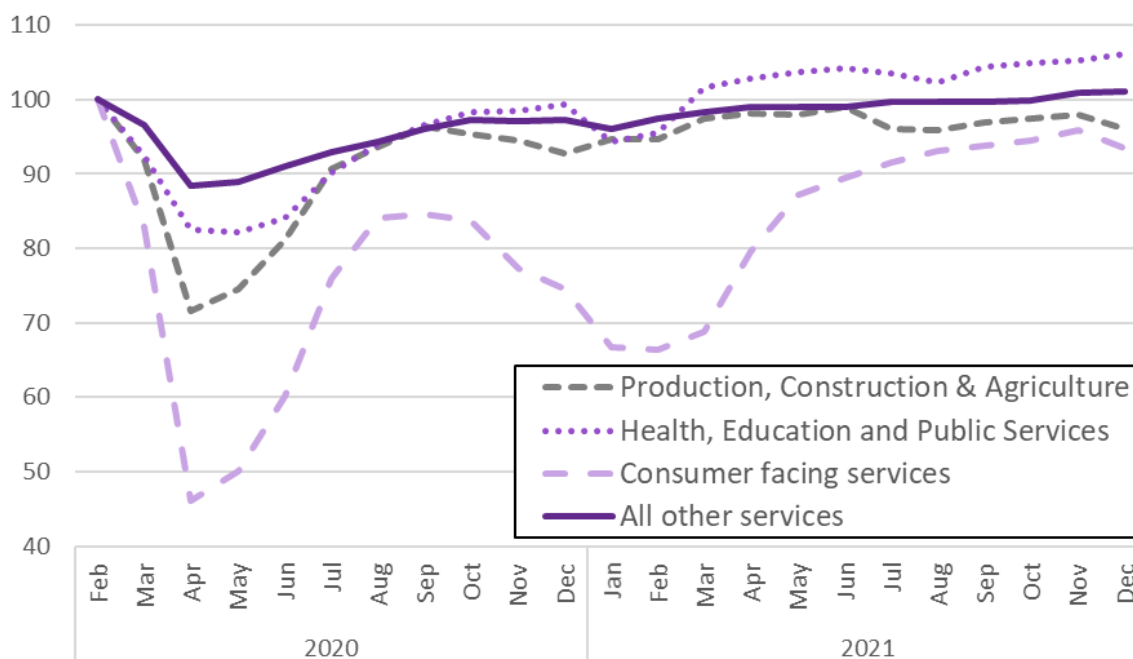


The largest negative contributions to growth in the services sector were from retail, wholesale and motor trades and accommodation and food services. At the broad level, output in the consumer facing services fell by 2.5% in total in December, including the contractions of 3.9% in retail and 3.4% in accommodation and food services. Overall output in the consumer facing services remains 6.5% below pre-pandemic levels.

Output in Health, Education and Public services grew by 0.9% during December, and is now 6.2% above pre-pandemic levels. Output in all other services, which experienced the smallest overall fall in output during 2020, grew by 0.3% in December. Overall output in this group is now 1.1% above

the level in February 2020, although there are variations between the results for specific industries within it and some subsectors still below the pre-pandemic level.

Monthly GDP by broad industry groups, February 2020 to December 2021
Chained volume measure, Feb 2020 =100



Notes:

- (1) Consumer facing services include SIC groups 45, 47, 49.1, 55, 56, 75, 79, 91, 92, 109-111
- (2) Users are advised to be mindful that the axis on this chart does not start at zero.

Production, construction and agriculture sectors

Overall output in the production, construction and agriculture fell by 1.9% in December, and is currently 3.9% below the level of February 2020. Output grew strongly during the first half of 2021 before falling back again in the second half of the year. This has been driven by volatile output across the manufacturing, construction and electricity and gas supply subsectors.

Within this group, output in the production sector, which accounts for around 16% of the economy, fell by 3.3% in December, with falls in three of the four subsectors. Overall production sector output is now 5.5% below the pre-pandemic level in February 2020.

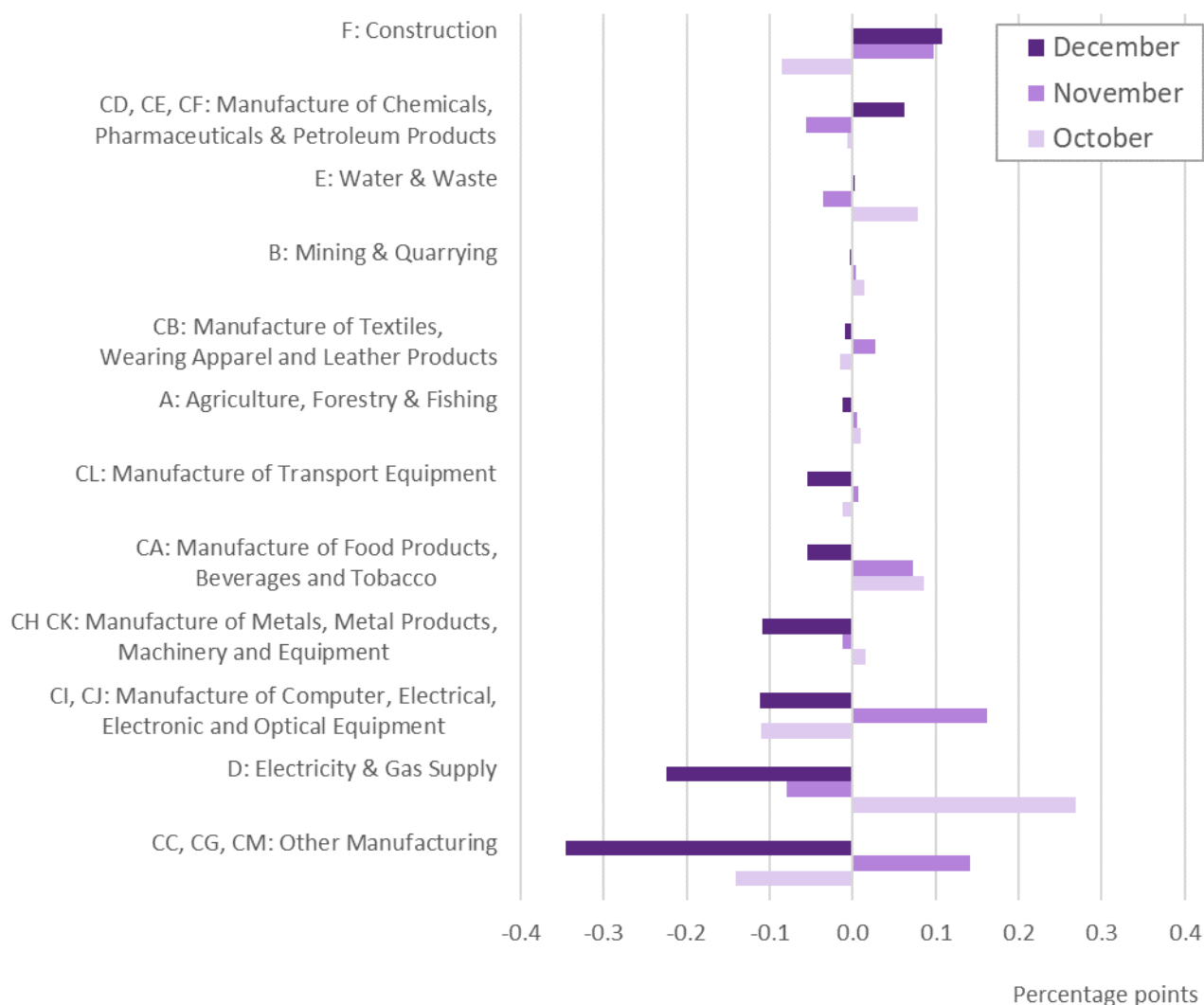
Within production, there were strong negative contributions to growth this month from the manufacturing subsector and the electricity and gas supply subsector. Manufacturing output decreased by 3.4% in total, after increasing by 1.4% in November. The output of many of the manufacturing industries continues to be relatively volatile from month to month, with strong negative contributions following strong growth in recent periods, even after accounting for regular seasonal fluctuations. Electricity and gas output decreased by 6.6% in December, which reflects ongoing month to month volatility from renewable energy production as well as the winding down of generation at one of the reactors at the Hunterston B power station.

Output in the construction sector, which accounts for around 6% of the economy is provisionally estimated to have grown by 1.9% in December, and is 0.6% above the pre-pandemic level.

Output in the agriculture, forestry and fishing sector, which accounts for around 1.5% of the economy, is estimated to have fallen by 1.0% in December.

Agriculture, Production and Construction Sector Contributions to GDP Monthly Growth: October to December 2021

Percentage points by SIC 2007 industry section



About These Statistics

Gross Domestic Product (GDP) is the broadest summary measure of economic activity, covering the activities of households, businesses and government as both producers and consumers.

Changes in GDP for the whole economy are estimated using the output of each industry. Monthly estimates have been developed as a faster indicator of the changes in output to help monitor the economic impact of the COVID-19 pandemic and policies in place to curtail its spread. These are intended to assist with analysis of the economy, including short term modelling and forecasting.

Data Sources

The Scottish Government produces estimates of quarterly GDP growth for Scotland using data sources and methods which are very similar to those used by ONS for the UK as a whole.

A large proportion of the data used for quarterly GDP is built up from monthly information. We have developed new methods and systems to use these data for monthly estimates. At the same time, we are continuing to seek out additional data and information which help to provide better monthly estimates for the parts of the economy covered by other data sources.

We are grateful to the data suppliers across other Government departments, the ONS, and businesses which have been able to supply us with timely monthly data in addition to the regular quarterly data we receive.

Information on the data sources and methods used for quarterly GDP can be found at [About GDP - gov.scot](https://www.gov.scot/about-gdp). Information relating to the development of monthly GDP will be added in due course.

Methodology

Around 45% of GDP by weight is based on the Monthly Business Survey and Retail Sales Inquiry. These surveys collect turnover data from all large businesses and a sample of smaller firms across the manufacturing and services sectors.

For quarterly GDP, estimates for each industry are produced using stratified ratio estimation. This approach requires extensive data processing and quality assurance checks which take several weeks to complete each quarter.

For monthly GDP, a faster method was developed and used in releases up to February 2021, estimating growth for each industry using a dynamic panel of companies which are surveyed in consecutive months. From March 2021, stratified ratio estimates have also been used for the monthly GDP estimates based on the MBS and RSI. This methodology and the detection and treatment of outliers remains in development, and users may notice that historic estimates (2010-2019) include relatively high levels of month to month noise while these systems are being improved. All estimates are constrained to the more robust quarterly results for previous periods.

Around 7% of GDP by weight is based on other data sources which are specific to Scotland, such as volumes of output by industry or electricity generation. Most of these sources have already been supplied to us as monthly data, or have been supplemented by additional monthly information during the development of monthly GDP.

Around 30% of GDP by weight is usually based on quarterly forecasts from annual data sources for Scotland. This includes the activities of much of the public sector, such as civil service, education and health services, as well as other industries including agriculture, and the imputed rental of owner-occupiers.

The output of these industries is normally assumed to move smoothly over time, with little variation from trend, and it would be a trivial process to interpolate a monthly path instead of quarterly. However, at this time of widespread economic disruption, the forecasts for these industries must be reviewed for quarterly GDP as well as monthly. For example, adjustments are needed to account for changes in the provision of education via remote learning. Provisional adjustments have been made which are consistent with the approach adopted by ONS for the UK and explained [here](#), with similar adjustments made for consistency in health and other sectors.

Around 18% of GDP by weight is based on estimates which are derived as shares of UK output, using indicator data such as Scottish employment shares, or are simply modelled to grow in line with the same industry across the UK as a whole. For example, this includes industries such as financial services, where quarterly output in Scotland is estimated using an employment based regional model run by the Bank of England for ONS.

At present, where the data used to take a share of UK output are not available for the latest months, many of these industries are forecast to grow in line with the UK as a whole, consistent with the latest UK monthly GDP release.

For all industries where estimates are not based directly on monthly data for Scotland, we are continuing to investigate potential sources of new data or information which can be used to ensure that estimates of short term output are as accurate as possible. Updates will be applied when possible in future releases.

Sector-specific methodology notes

Most of the results for the production sector are estimated using monthly business survey data, or other monthly data sources such as electricity supply and demand. For many of the industries within the Production sector, results can be quite volatile from month to month even after accounting for regular seasonal variations.

There is particular uncertainty in the estimates for construction sector output in Scotland due to there being very limited short-term regional data on output in the industry. At present, provisional monthly output is estimated based on the results for Great Britain as a whole, and has been adjusted using data on the relative differences in uptake of the [Coronavirus Job Retention Scheme](#) and some data available from the Business Insights and Conditions Survey (BICS). These results will remain under review and be updated when any other relevant data become available.

Estimates for much of the services sector are based on monthly business survey data, including the retail sales inquiry, or other monthly data sources including passenger transport information. Since June 2020, specific adjustments and checks have been required to account for the different timings of re-opening in Scotland compared to England and Wales, and the subsequent new restrictions introduced across parts of the UK from October onwards. The methodologies used for these adjustments remain under review and will be updated and extended as other industries fall into scope and more data become available.

Estimates for Public Administration & Defence, Education and Health are mostly based on annual data sources which are normally forecast smoothly for Quarterly GDP. Specific adjustments have been developed to reflect the impact of COVID-19 on the provision of some public services, such as lower levels of education activity due to school closures. For changes in health service activity, provisional adjustments have been made which are broadly in line with the estimates of monthly GDP for the UK as a whole, and will be reviewed and revised over time as more data becomes available. There was a particular methodology challenge for the education sector in accounting for

the 2020 school summer holiday period in monthly seasonally adjusted terms, because of the shift from schools operating with most pupils at home before the holidays and then returning to normal after the holidays. Initial estimates have been made which spread the level shift of this re-opening smoothly over the course of the holidays.

The Scottish Government has used similar methods to ONS to ensure comparisons can be made within the UK, but ONS also note that [differences in the methods for estimating the output of health and education services](#) across different countries mean GDP may be less internationally comparable during the COVID-19 pandemic and recovery than usual, so should be made with increased caution.

Accuracy and Reliability

In all economic statistics there is a trade-off between timeliness and accuracy. Early estimates are always provisional and are revised over time as more complete data become available.

It is not possible to assess the accuracy of monthly GDP growth rates because there are no “true” values to compare them with. However, the accuracy of the rolling quarterly growth rate (latest three months compared to previous three months) can be compared to the corresponding quarterly GDP growth rate to indicate how reliable the short term measures are over a horizon of three months – the farthest out that the monthly measures go without being constrained to Quarterly GDP.

Prior to the launch of Monthly GDP, analysis of estimates over the last five years (20 quarters to 2020 Q1) indicated that there has been an average absolute revision of around 0.2 percentage points between the provisional quarterly growth rate in monthly GDP and the corresponding estimate from quarterly GDP, with revisions slightly more likely to be down than up (-0.05%). Since this analysis was undertaken the methods used for monthly GDP have been continuously developed and improved.

Under the current circumstances, with unprecedented changes in output, and data collection issues including falling sample sizes and response rates, it is likely that this margin of error will be higher over the course of the pandemic, and that measures of quarterly and annual GDP could also be revised considerably over time.

In normal times, these levels of revision might be considered too high to make the trade-off between timeliness and accuracy worthwhile. However, during the current economic crisis, and based on the forecast level of disruption which is expected to occur, we judge that there is public value in producing these estimates to help with the analysis, modelling and forecasting of output in Scotland.

Revisions

Revisions to previous estimates are detailed in Table R1 on the downloadable tables.

Estimates in this release have been updated to be consistent with the GDP Quarterly National Accounts for 2021 Quarter 3, and therefore contains revisions at the quarterly level back to the start of 2020.

An Experimental Statistics Publication for Scotland

Experimental statistics are a subset of newly developed or innovative official statistics undergoing evaluation. They are published to involve users and stakeholders in the assessment of their suitability and quality at an early stage.

The Office for Statistics Regulation publishes guidance on experimental statistics [here](#).

The Scottish Government is developing these estimates on an ongoing basis, and is grateful to the ONS, BEIS, and other departments and businesses which have assisted in the identification or delivery of earlier data sources which enable the timely production of monthly GDP.

We welcome any feedback on the development of these statistics, using the contact details below.

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Complaints and suggestions

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