This methodology guide gives information about the statistics for total onshore GDP and output by industry in volume (or real) terms. These methods are used for the First Estimate of GDP and updated in the Quarterly National Accounts.
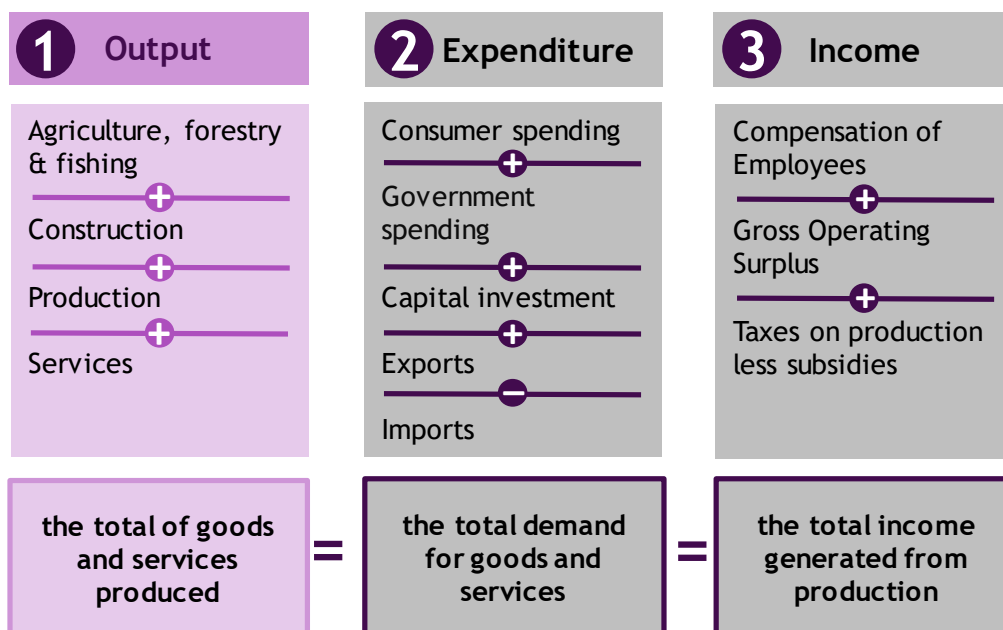
Contents

1: Understanding GDP

Introduction

Gross domestic product (GDP) is one of the best known indicators of economic activity and is widely used to monitor economic performance. The monetary value of GDP is used to represent the size of an economy, and its growth rate *in real terms* (explained below) is used to indicate the overall 'health' of the economy.

This paper is about GDP in real terms, also known as the volume measure of GDP. Estimates of Scotland's GDP growth in real terms are for activity in the onshore economy, meaning that they do not include the output of offshore oil and gas extraction.

Publications of real GDP for Scotland are updated twice each quarter – in the **GDP First Estimate** publication, followed by an updated second estimate in the **GDP Quarterly National Accounts** publication. The First Estimate publication only covers the output approach to GDP and includes results for the whole economy (total GDP) and industry sectors. The Quarterly National Accounts includes updated estimates for the output approach to GDP, and also contains results for the expenditure and income approaches to GDP, the cash value of GDP (in nominal monetary terms) and other statistics not included in the first estimate.

1 Output	**2** Expenditure	**3** Income
Agriculture, forestry & fishing ⊕ Construction ⊕ Production ⊕ Services	Consumer spending ⊕ Government spending ⊕ Capital investment ⊕ Exports ⊖ Imports	Compensation of Employees ⊕ Gross Operating Surplus ⊕ Taxes on production less subsidies
the total of goods and services produced	**the total demand for goods and services**	**the total income generated from production**

This paper presents many definitions and concepts in a deliberately simplified manner. A good source of more detailed information is the [Office for National Statistics](). A glossary of some key terms is included at the back of this paper.

What is GDP?

In simple terms, GDP measures the size of an economy based on the production of goods and services in a country or region during a particular period of time.

More formally, GDP is equal to the total <u>value added</u> by the production of goods and services during each year or quarter, known as Gross Value Added (GVA), plus the value of taxes on products (such as Value Added Tax, VAT) minus any subsidies on products[1] which are added to the cost of those goods and services.

Value added is equal to the price charged for goods and services (i.e. the value of output) minus the cost of any goods and services used up while producing that output (i.e. the value of intermediate consumption). The value added approach avoids double counting the costs of goods and services which are re-used or re-processed at many different stages of a supply chain. GDP includes the economic activities of businesses, government, households and non-profit institutions across the economy.

GDP is defined in the UN System of National Accounts, which sets out a framework to enable consistent measurement across the world. A slightly adapted version of the framework – the European System of Accounts (ESA 2010) – is produced by Eurostat, the statistical agency of the European Commission. UK and Scottish GDP statistics currently conform to the ESA guidelines, which allow GDP statistics to be compared internationally and over time.

What does GDP not cover?

In general, GDP only covers economic transactions in produced assets and services (such as where a sale occurs or there is a change in ownership). There are many activities that have an economic or social value that are not included in GDP, such as unpaid family care. For this reason and many others, GDP is not a direct measure of national well-being.

Measuring GDP growth in real terms using the Output approach

Most data sources used for estimating GDP are based on the cash values of output and inputs at the time of production. Statistics valued in this way are referred to as being in 'current prices' or 'nominal terms'. When the value of nominal GDP grows between two periods, this can either be due to rising prices (inflation), increased number of sales or volume of output, or – more usually – some combination of both these factors.

When GDP is adjusted to remove the effect of price inflation – a process known as deflation – the resulting growth rate represents only the change in the amount of goods and services being sold. This adjusted GDP figure is referred to as being in 'volume' or 'real terms', and is usually taken as a better measure for comparison over time.

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[1] This definition of GDP is called the Production approach. There are two other approaches to measuring GDP – Income and Expenditure – described briefly in Annex B.

In other words, real terms growth simply indicates whether the volume of output in the economy is going up or down on a like-for-like basis, whereas nominal growth also contains the impact of rising or falling prices on the value of that output.

For longer term annual GDP, both the outputs and inputs of industries can be estimated and separately deflated to calculate changes in GVA in volume terms for each industry.

However, for short-term statistics such as quarterly GDP, usually only the output of industries can be reliably estimated. Therefore estimates of growth in real terms are based on the volume of output of each company or industry, without accounting for the volume of inputs. This approach to real GDP is known as the Output approach, and is a simplified version of the full Production approach which is used over the longer term.

Industry Classifications

The output approach for GDP measures the activity of each industry in Scotland and combines them together to form an estimate for the whole economy. This is done using data for around 100 different industries. This approach allows each area of the economy to be considered separately (e.g. to identify which sectors are driving overall growth), and to make use of different data sources which are most appropriate for each industry.

An industry is a collection of economic units (businesses, non-profit institutions or public sector bodies) that do similar things. The UK Standard Industrial Classification (SIC, 2007 edition) is used to define which industry each business is in. SIC 2007 is based on a common international classification system, allowing comparisons between countries. Every business is split into one or more 'reporting units' which each belong to only one industry. Businesses that carry out more than one activity are classified to the activity with the highest employment, known as the principal activity of the business. For example, a business which brews beer and runs pubs might be classified to either manufacturing or beverage services depending on whether it has more employees at breweries or bars.

At the highest level, industries are classified between four main sectors: Agriculture, Forestry & Fishing; Production; Construction; and Services. Within these sectors the following broad industries are identified and most commonly referred to in commentary. More detailed results are also available for further breakdowns of the Services and Manufacturing sectors.
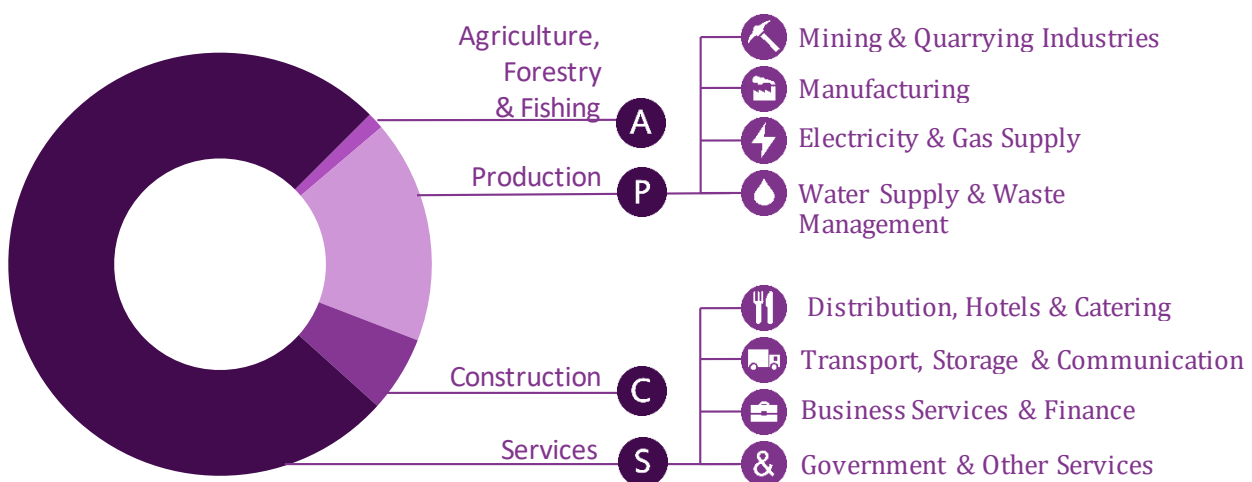
2: Quarterly GDP Methods (Output Approach)

This section summarises the end-to-end process of estimating quarterly growth in Scotland's GDP using changes in the output of industries.

In broad terms, the activity of each industry in Scotland is measured and combined together to form an estimate for the growth rate of the whole economy. The activity of each industry is either estimated directly in volume terms, or by measuring in current prices and then removing the effect of price changes by deflating. The methods used by the Scottish Government have been designed to closely replicate the equivalent methods used by the Office for National Statistics (ONS) for quarterly GDP growth for the UK as a whole, and most of the data sources used are the Scottish extracts of the UK data.

As noted previously, the Output approach for the quarterly statistics uses data on output alone to estimate change in Gross Value Added and GDP in recent periods, without data on inputs. In the detailed annual national accounts (Supply and Use Tables[2]), published several years after the period of interest, the Production approach – which also accounts for the intermediate consumption (inputs) of industries – is used for GDP in current prices. However, for the quarterly statistics which extend beyond the years covered by Supply and Use tables there is no information to estimate intermediate consumption, so changes in output are used as the sole indicator of changes in GVA.

It should be noted that, technically speaking, the Output approach to GDP actually measures growth in GVA of the economy and uses this as a proxy for GDP. GVA is measured at 'basic prices' (without the value of consumer taxes such as VAT), whereas GDP is measured at 'market prices' which include all the taxes paid by consumers which are added to the value of goods. This approximation is reasonable, with growth in GVA at basic prices and GDP at market prices observed to be very similar in other countries which do report them separately. Conceptually, there is no straightforward method for estimating changes in consumer taxes in volume terms, and therefore it requires estimates of the Expenditure approach of GDP to estimate real growth of GDP at market prices directly.

Sources

A wide range of data sources are used to estimate GDP, which provide either direct measures of output, or an indirect (proxy) indicator of output. For most industries, turnover is used as a proxy for output[3]. Alternatively, some data sources directly measure the volume of output by industry, such as the number of passenger journeys made by train.

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[2] Supply and Use Tables: http://www.gov.scot/input-output

[3] Formally, the output of an industry includes things like work in progress, which will not be reported as turnover until it is completed and sold.

Sources vary in their periodicity (usually annually, quarterly or monthly) and whether they are expressed in current prices (requiring deflation), volume terms or both. We estimate output at a level of around 100 separate industries. Details of the sources used are available in the Sources and Weights Catalogue[4] online.

Turnover Data Methodology

The main source for turnover data for Scotland's quarterly GDP is the Monthly Business Survey (MBS), carried out by the Office for National Statistics. This survey collects information on a monthly basis from businesses of different sizes operating across many industries in Great Britain[5]. Data from the MBS is used to estimate growth in around 45% of Scotland's economy.

The MBS collects a single turnover value for each business reporting unit, but does not collect data on a branch or regional basis. Estimates are based on the survey returns from all business reporting units which have a branch in Scotland. For sampled businesses which operate across different parts of Great Britain, a share of total GB turnover is taken based on their employment in Scotland.

The MBS collects data from all large companies (for most industries this means those with more than 250 employees) and a representative sample of smaller companies. The survey results are then used to calculate an estimate of total turnover for each industry. This process, known as 'grossing up' the turnover from the sample to represent each whole industry, uses information about all companies in the industry to work out the appropriate weight to be applied depending on how representative the sample is of each industry as a whole. The weighting and grossing up is completed by Scottish Government statisticians using the Inter-Departmental Business Register (IDBR), which contains data on the size and structure of UK businesses registered for VAT or PAYE.

The weighting and grossing up procedure uses a method called stratified ratio estimation, where results are calculated separately for each industry and usually for three different size bands within each industry. The weights used for producing grossed up MBS turnover are subject to a large amount of manual quality assurance work each quarter, where statistical outliers (exceptionally high or low values) are identified and adjusted to ensure that they do not disproportionately influence the results.

Deflation

When the output of an industry is measured in current prices, the results must be adjusted to remove the effects of price changes. This process is known as deflation, and produces estimates of the volume of output produced over time. The main data sources requiring deflation are the Monthly Business Survey-derived estimates of turnover described above.

All price deflators used for Scotland's GDP statistics are supplied by the Office for National Statistics. Most of these are sourced from the equivalent UK GDP system, and are based on

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[4] About GDP Statistics: GDP background documents - gov.scot (www.gov.scot)

[5] Businesses are required to report data for activity in Northern Ireland on separate surveys

producer price indices, export producer price indices, services producer prices and consumer prices as appropriate for each activity.

No sub-UK price indices are currently produced, meaning that UK price information needs to be used for Scottish statistics and for other sub-UK areas. Eurostat guidance is that, given that regional price data for deflation are rarely available, it is appropriate to use national prices if they are applied at a sufficiently detailed level that regional differences in the industrial structure of the economy are accounted for. It can be generally expected that regional prices for detailed products develop at about the same price in difference parts of a country (i.e. price <u>changes</u> are similar, but not necessarily price <u>levels</u>), except for industries such as the government sectors and housing.

Detailed prices for goods and services are applied at the same level as output is estimated, for approximately 100 industries. After this point in the production process, the deflated turnover estimates can be thought of simply as derived measures of the volume of output for each industry, and then combined with other direct volume measures for the remaining industries.

Direct Volume Estimates

For some industries where turnover or price information is difficult to collect, and where the output of the industry is well measured by other sources, a direct volume measure is used. For example, production of refined petroleum products and coal are both monitored by the government for energy statistics purposes, and the production data are used for GDP.

For the non-market sectors of the economy such as public health care, education, or public administration – where services are either provided free of charge or not sold at an economically significant price – output cannot be defined in the same way that sales of a business are. For these industries, output in volume terms is measured using direct data on the levels of service provided. For example, NHS healthcare is measured using a cost-weighted activity index, where the number of clinical procedures completed are combined together based on how much they cost.

Seasonal adjustment

Many industries see significant changes in output at the same times each year. These regular annual patterns in output are known as seasonal factors, and can be due to a number of reasons including the weather (e.g. electricity supply), holidays (e.g. Christmas), calendar effects (the number of business days in a given month or quarter) or production cycles (e.g. fishing).

Although these seasonal patterns are usually specific to particular industries, they can show up in overall GDP statistics and make it difficult to compare different time periods directly. For example, if retail sales *always* increase in the fourth quarter of each year, it is not particularly meaningful to publish a positive growth rate for every quarter four, followed by a decline in every quarter 1. Instead, it is more meaningful to report whether output growth is *particularly strong*, or otherwise, over this period.

The scale of these regular seasonal patterns is estimated and removed from the results to better represent the underlying trends and highlight any irregular unseasonal movements. The results for

each industry are seasonally adjusted individually, if appropriate, before they are combined into total GDP.

Double Deflation and Benchmarking to Annual National Accounts

Whilst the output methods used for quarterly GDP provide a good measure of short-term changes, over the longer term there are other sources of information which provide more detail and greater accuracy. The most significant of these are the Scottish part of the ONS Annual Business Survey (ABS), the UK Supply and Use Tables, and UK Regional Gross Value Added statistics. These sources provide the core inputs to estimating the level of gross domestic product (GDP) through the Scottish Supply and Use Tables, which are based on balancing all available information to come up with the best estimate of output and GVA for each industry (as well as other aspects of supply and demand in the economy). The Supply & Use tables are published around 3 years behind the year they describe. More information on Scotland's Supply & Use tables (including a user guide) is available at www.gov.scot/input-output.

The annual supply and use are also now used to produce estimates of GVA for each industry in volume terms using a method known as double deflation. The annual volume GVA for all industries is estimated by separately deflating the output and intermediate consumption of each industry using prices for each of the products produced and consumed. The introduction of this double deflation methodology in May 2022 marked a significant improvement towards international best practice for volume GDP methodology, and improves the comparability of GVA and GDP estimates between Scotland and the UK as whole.

The quarterly volume measures are then constrained to the annual double deflated GVA series for each industry in a benchmarking process, which ensures that the more reliable annual information is used to determine the longer terms trends in the volume of output up to 2018 (at the time of writing), while the quarterly data continues to indicate the within-year growth patterns and the movements in recent years.

Weighting and chain-linking

Finally, after the output of each individual industry has been deflated, seasonally adjusted and benchmarked to annual sources, the results are combined together to produce estimates for broader industry sectors and for the economy as a whole.

This process uses information on the relative size of each industry – known as its weight – based on the proportion of total GVA it accounts for. This information on the GVA weight of each industry is sourced from the annual national accounts supply and use tables.

Over time the structure of the economy changes. For example, the manufacturing sector accounted for 18% of GVA in 1998 but reduced to 11% by 2015, while the Services sector increased its share of the economy over this period. To ensure that the contribution each industry makes to growth reflects the changing structure of the economy over time, annual weights are used for each industry in a process known as chainlinking.

When annual chainlinking is used, the GDP growth rates for 1999 are based on 1998 weights, growth rates for 2000 are based on 1999 weights, and so on. At the time of writing, the latest weights are for 2018, meaning that growth in 2019, 2020, 2021 and 2022 are all based on 2018 weights. When this technique is used, the resulting GDP statistics are referred to as a chainlinked volume measure (cvm), or more simply GDP in volume or real terms.

Indexing the results

Scotland's GDP in real terms is published as an index number, with the value in each quarter set relative to a reference year where GDP is set to equal 100. This presentation is known as a volume index, and can be used to easily calculate changes over time. For example, in the table below, an index number of 101.0 in 2019 relative to the reference year of 2018=100 simply means that GDP is 1.0 per cent higher in real terms than in 2018.

A separate index is calculated for each industry sector. Each industry's volume index should be read vertically in the published tables, and growth rates can be compared between industries. However the index values for different industries cannot be added together horizontally across the table.

	Gross Domestic Product	Agriculture, Forestry & Fishing	Production	Construction	Services
2018	100.0	100.0	100.0	100.0	100.0
2019	101.0	107.9	101.7	96.0	101.1
2020	90.3	103.4	90.8	75.3	91.1
2021	96.9	104.0	96.3	86.9	97.7

Any year can be selected as the reference year because it does not have any effect on the growth rates or trends; but by convention the Scottish GDP index is referenced to the year of the latest weights (also known as the base year). At the time of writing, this reference and base year is 2018, where the chained volume indices for each industry are set to 100. The reference year moves on by a year annually, at which point the index is re-scaled to give new values for each period. Re-scaling the index changes the index values for each quarter, but does not change the growth rates between quarters (although growth rates can also be revised for other reasons).

An alternative presentation of GDP in volume terms is to reference the series to a current price (nominal) cash value instead of '100'. When this is done the results are said to be, for example, a 'chained volume measure of GDP in real 2018 prices'. The value of total GDP in real terms is presented in this way in the Quarterly National Accounts release.

3: Publication and Revisions Policy

Publication schedule

Scotland's Quarterly GDP growth is updated twice each quarter:

- There is an earlier First Estimate of GDP released approximately 60 days after the end of each quarter, and around 2 weeks after the corresponding ONS release for the UK as a whole.

- This is followed by an updated second estimate of GDP in the Quarterly National Accounts at approximately 120 days after the end of the quarter, and around 1 month after the corresponding ONS release for the UK as a whole.

The publication schedule is illustrated below, including provisional publication dates.

Date of Publication	Reference Period			
	2022 Q2	2022 Q3	2022 Q4	2023 Q1
12-Aug 2022	UK 1st			
31-Aug 2022	Scot 1st			
30-Sep 2022	UK QNA			
02-Nov 2022	Scot QNA			
11-Nov 2022		UK 1st		
30-Nov 2022		Scot 1st		
22-Dec 2022		UK QNA		
01-Feb 2023 *		Scot QNA		
Feb 2023			UK 1st	
01-Mar 2023 *			Scot 1st	
Mar 2023			UK QNA	
26-Apr 2023 *			Scot QNA	
May 2023				UK 1st
26-Jul 2023 *				Scot 1st
Jun 2023				UK QNA
30-Aug 2023 *				Scot QNA

* provisional dates to be confirmed 1 month prior to publication

Updates between the First Estimate and Quarterly National Accounts

The second estimate of GDP growth routinely includes updates to data sources which account for around 12% of Scotland's GDP by weight. These are predominantly those derived from the detailed sub-components of UK GDP, such as mining support and financial services, plus a relatively small component of renewable electricity generation. In the first estimate, these data are sourced from the equivalent UK first estimate, and then updated using the equivalent UK Quarterly National Accounts data for the second estimate. For some other components, such as wind powered electricity generation, a provisional data source is replaced with more comprehensive date in the second estimate.

Different ways of measuring growth rates

Scotland's GDP publications and tables reference short term GDP growth figures in several alternative ways – these are all derived from the same chainlinked volume indices, but are used in different ways.

- **Percentage change in the latest quarter compared to last quarter**, or the quarterly growth rate, is usually the headline measure of GDP growth. This gives the shortest-term and most up to date measure of recent change in the economy and picks up turning points (such as dips into negative growth) immediately. The downside of quarterly growth rates is that they can vary a lot from quarter to quarter and not represent current underlying trends.

- **Percentage change in the latest quarter compared to the same quarter last year**, also referred to as over-the-year growth, or annual growth in quarterly GDP, is another common measure. This growth rate is calculated in a similar way to headline inflation and wage statistics, which makes it useful for comparing to other economic indicators. Growth over the year can also smooth out some of the volatility seen on a quarterly basis, while still being relatively fast to pick up turning points in the economy. The growth rate over the year is based on how much GDP has changed in total across each of the latest four quarters.

- **Percentage change in the latest 4 quarters compared to the previous 4 quarters**, also referred to as rolling annual or 4Q-on-4Q growth gives is a measure of growth in annual GDP rather than the quarterly measures above. This growth rate depends on output during each of the latest eight quarters, and is equal to annual (calendar year) GDP growth in the fourth quarter of each year. 4Q-on-4Q growth can give a smoother estimate of recent trends, but does so with the downside of being a 'lagged' indicator which does not pick up turning points in the economy until after they have occurred.

- **Percentage change in the latest year compared to the last year**, or the annual GDP growth rate, is commonly used for considering growth in the context of longer term trends and averages. As noted above, annual GDP is equivalent to the 4Q-on-4Q (rolling annual) growth rate in the fourth quarter of each year.

Medium- to long-term trends in GDP growth are usually measured by calculating the average annual growth rate over a larger number of years, often taken as 10 or 30 years trends, which remove the variations in growth from different stages of business cycles.

GDP per person

GDP per person is calculated by dividing GDP in volume terms by the population estimates and projections for Scotland. It is not a direct measure of productivity or well-being, but is a useful statistic as it removes the impact of the changing size of the population from headline GDP figures.

Estimates of GDP per person for Scotland are based on population estimates and projections produced by National Records of Scotland. GDP per person calculations are based on applying the mid-year estimate or projection as both the annual total and the value in Q2 of each year, with a

straight line change in population calculated for Qs 1,3, and 4. Therefore the average value of quarterly GDP per person does not equal annual GDP per person. This method is also used by ONS for UK statistics.

Rounding

Chained volume indices are presented in the tables with rounding to 1 decimal place. The spreadsheet tables include the underlying results without rounding to allow for accurate calculations to be made on the data, but the estimates should not be considered accurate at the level of multiple decimal places.

Growth rates are calculated using unrounded index data and presented to 1 decimal place. It is not always possible to replicate the growth rates using rounded index data.

Open Data

In addition to the results tables, index numbers, annual and quarterly growth rates can also be explored, visualised, downloaded and linked under the Economy theme at http://statistics.gov.scot

Key Quality Issues

The accuracy of GDP (i.e. how close is an estimate to the true value) is almost impossible to assess because it is estimated using a large number of data sources which each have their own margin of error, and there is no single 'true' data source. Instead, other dimensions of statistical quality are usually monitored to assess the statistics. In particular, timeliness and reliability are highly valued.

The reliability of GDP statistics is usually determined by how much initial estimates are revised over time. If revisions are too large then the value of the statistics is reduced. The timeliness of GDP statistics is particularly important for guiding and evaluating economic policy and the behaviour of people and businesses. There is therefore a careful balance which must be achieved between ensuring that the data are timely (i.e. published as early as possible) and reliable. Expectations of accuracy and reliability in early estimates are often too high, and revisions are an inevitable consequence of this trade-off between timeliness and accuracy.

Analysis published alongside Scotland's GDP has showed that that growth rates in the statistics are typically revised, on average, by around plus or minus 0.1 percentage points in the quarter following their initial release, and by around plus or minus 0.2 percentage points over the course of the next year. Occasionally there have been much larger revisions introduced to the statistics due to methodology improvements or changes to data sources.

Similar statistics for the UK and OECD members demonstrate that this scale of revisions is normal by international standards. Internationally, the OECD publishes similar analysis of Revisions of quarterly GDP in selected OECD countries. This analysis shows that, on average amongst the 18 countries considered, GDP growth rates are revised by +/- 0.18 percentage points between first

estimates and the result published five months later, and by +/- 0.3 percentage points by one year later. There is considerable variation in these revisions between the countrie s selected.

Revisions Policy

Revisions to economic statistics such as GDP are an inevitable consequence of the trade -off between timeliness and reliability. Early estimates are usually based on incomplete data or proxy indicators, and are updated as better information becomes available over time. Many components of GDP and the national accounts are best measured using annual surveys, or via administrative data such as tax returns, which are not collected until considerably after the reference period. In fact, GDP statistics are never truly finalised, with occasional methodology and classification reviews meaning that the conceptual definitions used in the national accounts can be updated and revised years, or even decades, into the future.

Due to the extensive use of UK-derived source data and the importance of consistency and comparability with UK GDP statistics, the revisions policy for Scotland's GDP closely resembles the equivalent approach used by ONS for the UK.

- There will usually be no revisions to previous quarters when the first estimate of GDP is published. Results for all previous periods will remain unchanged from the previous Quarterly National Accounts. This approach is consistent with ONS GDP statistics, ensuring consistency and comparability with both the UK, and also with the other measures of GDP published in the latest Quarterly National Accounts for the prior quarter. There is usually one exception to this rule each year, for the third quarter, when the ONS updates some data sources back to the start of the latest year.

- Periods of time covered by annual data sources will only be re -assessed and subject to revisions on an annual basis. Therefore in most publications each year, only recent quarters will be open to revision. This approach is currently used for Scotland's GDP, and is also broadly consistent with the ONS policy for UK GDP statistics.

The timeline for which periods will be open to revision within each publication in the coming year and into the next year is shown below.

Publication	First period open for revision	Notes
First Estimate 2022 Q2	N/A	
Quarterly National Accounts 2022 Q2	2019 Q1	Revisions back to base year
First Estimate 2022 Q3	N/A	
Quarterly National Accounts 2022 Q3	1998 Q1	Update of weights and base year to 2019
First Estimate 2022 Q4	2022 Q1	Full year revisions in line with ONS for UK
Quarterly National Accounts 2022 Q4	2021 Q1	Full year revisions in line with ONS for UK
First Estimate 2023 Q1	N/A	
Quarterly National Accounts 2023 Q1	2023 Q1	Revisions to latest quarter only

ANNEX A: Glossary

Gross Domestic Product (GDP) – A measure of economic activity based on the production of goods and services within a country or region during a year or a quarter year. GDP refers to the total activity of all sectors of the economy and is usually valued at market prices. GDP can be measured as total Gross Value Added (GVA) in the economy plus the value of taxes (less subsidies) on products received by the government.

Gross Value Added (GVA) – Equal to the value of produced output minus the value of intermediate consumption. GVA can be measured for individual companies, entire industries, sectors or the whole economy. By counting only the value added at each stage of the production process (e.g. raw materials, manufacturing, assembly, retail) there is no double counting of output. GVA is valued at basic prices. GDP is equal to total GVA plus the value of taxes (less subsidies) on products such as VAT.

Output – The value of the goods and services produced. In simple terms this is the value of sales for businesses, but can also include the value of 'work in progress'. Output is defined in other ways for non-market producers such as government bodies. Output is valued at basic prices. For example, turnover excluding VAT.

Intermediate Consumption – the value of the goods and services purchased to be used up during the production of output. In simple terms this is the operating costs of a business, and does not include capital expenditure or labour costs. Intermediate consumption is valued at basic prices. For example, purchases excluding VAT.

Market prices – The price paid for goods and services by the purchaser. For example, consumer goods are valued including VAT.

Basic prices – The price charged for goods and services by the producer, excluding taxes (or subsidies) which are added to that price by the government.

Taxes and subsidies on products – taxes levied (or subsidies paid) on the cost of goods and services, where the level of tax is defined as a proportion of the sale. This includes Value Added Tax (VAT), import taxes and excise duties.

Current prices – sales and purchases as valued at the time of transaction.

Nominal terms – growth in current prices is also known as growth in nominal terms includes the effects of price inflation on changes in output as well as changes in quantity.

Volume – The quantity of a good or service produced. This can be measured directly in terms of physical units (e.g. tonnes produced, passenger miles, etc.) or derived by deflating a current price value.

Real Terms – growth of GDP is said to be in real terms when the results represent changes in volume or quantity.

Market producer – a business which sells its output at an economically significant price. Usually this means that sales income is required to meet the majority of the operating costs of the business.

Non-market producer – bodies such as government or non-profit institutions which supply their output for free or at economically insignificant prices. The majority of operating costs are met by grants, donations or tax income.

ANNEX B: Gross Domestic Product (GDP) and the different approaches to measuring it

Gross Domestic Product is an important measure of economic activity, and GDP growth is commonly used as the main indicator of economic performance for a country or area. There are three ways in which GDP can be defined and measured. In theory these approaches are just three ways of estimating the same thing, and with a complete set of perfect data they would all provide the same result.

- The output (or production) approach to measuring GDP estimates Gross Value Added (GVA) at a detailed industry level before weighting these together to produce an estimate for the whole economy. GDP is then calculated by adding the value of taxes (and subtracting subsidies) on products, such as VAT. Gross Value Added is the value of all goods and services produced less the value of goods and services used up in the production process. The output approach is used to produce estimates of growth in Scottish GDP in real (volume) terms and in current prices (nominal terms).

- The income approach to measuring GDP estimates income generated by the factors of production in the form of compensation of employees (income from employment) and gross operating surplus (profits, including self-employment income) for the whole economy, plus the value of taxes (less subsidies) on products and production. Unearned and redistributed incomes, such as interest, pensions, income taxes and social benefits, are not counted here. GDP measured using the income approach is only available in current prices (nominal terms) because there are no price measures for GOS and it cannot be deflated.

- The expenditure approach to measuring GDP estimates all domestic final expenditure (consumer expenditure, government expenditure, and capital investment) within the economy, plus the value of exported goods and services, minus the value of imported goods and services. The components of the expenditure approach are widely used for economic analysis, modelling and forecasting of supply and demand in the economy. At the present time, estimates of GDP using the expenditure approach are available in current prices (nominal terms) as national statistics, and in volume terms as experimental statistics (published but with ongoing development) for Scotland.

Balanced GDP

Although GDP can be measured in three different ways, in theory each approach should give the same result. However, in reality the three approaches tend to produce different results because of factors such as sampling error or missing data. After a large amount of data for a complete year is available, the different sources of information are compiled into Supply and Use tables, and adjustments are made which produce a single set of numbers where all three approaches to GDP are balanced and consistent.