

## Article

# Impact of Blue Book 2023 changes on gross domestic product

Impact of methodological and data improvements on current price and chain volume measure of quarterly gross domestic product (GDP), 1997 to 2021.

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# 1 . Overview

The 2023 Annual National Accounts, also known as Blue Book 2023, will incorporate a wide range of improvements to sources and methods. These include:

- introducing new methodology to improve estimates of the impact of global supply chains
- implementing outstanding classification decisions affecting the public sector
- a range of improvements to the deflators used across the National Accounts
- completing a further group of data source and method changes to improve the international comparability of UK gross domestic product (GDP) estimates
- estimating 2021 for the first time using the supply and use tables (SUTs) framework, and improving our estimates of 2020 with the latest data; this looks at the supply of goods and services and how they are used in the economy, and their associated prices, in great detail

In our [previous publication \(published 3 July 2023\)](#), we showed the indicative annual impacts for the period 1997 to 2020. We also provided an update that we will not be moving forward our [reference and last base years](#), which will remain as 2019.

This article will cover the indicative annual and quarterly impacts resulting from changes to sources and methods, as well as confronting the year 2021 through the SUT framework for the first time.

The latest Organisation for Economic Co-operation and Development (OECD) information shows that the UK is one of the first countries in the world to estimate the 2020 and 2021 coronavirus (COVID-19) pandemic period through the SUT framework. The United States and France has also published SUTs for 2021.

This means that the UK has one of the most up-to-date sets of estimates for this period of considerable economic change. Other countries follow different revision policies and practices, which can result in their estimates being revised at a later date. It is important this is considered when comparing the UK with other countries and our international comparison position is likely to change once other countries fully confront their datasets over time.

We will publish further analysis later in September 2023, providing additional lower-level estimates of these indicative impacts and those to the Institutional Sector Accounts ahead of the publication of [Blue Book 2023 on 31 October 2023](#).

## 2 . Main impacts of our changes

- Revisions from 1997 to 2019 are generally small, however there are larger revisions to 2020 and 2021, although the quarterly and monthly profile through the years is relatively little changed.
- Annual current price gross domestic product (GDP) growth in 2021 is revised up 0.9 percentage points to an 8.5% increase; this follows an unrevised fall of 5.8% in 2020.
- Annual volume GDP growth in 2021 is revised up 1.1 percentage points to an 8.7% increase; this follows an upwardly revised 10.4% fall in 2020 (previously an 11% fall).
- Upward revisions to annual volume GDP growth in 2020 and 2021 mean that GDP is now estimated to be 0.6% above pre-coronavirus (COVID-19) pandemic levels in Quarter 4 (Oct to Dec) 2021; previously this was estimated as 1.2% below.
- These revisions are mainly because we have richer data from our annual surveys and administrative data, we are now able to measure costs incurred by businesses (intermediate consumption) directly and we can adjust for prices (deflation) at a far more detailed level.

### 3 . Bringing together the three approaches to measuring GDP in 2021

In the [National Accounts](#), gross domestic product (GDP) is measured by the output, income and expenditure approaches, where these are balanced to produce one coherent estimate of GDP.

In the UK, we use the [supply and use tables \(SUTs\) framework](#) as the basis for producing annual estimates of GDP. We use comprehensive information to fully reconcile how the economy performs across 112 industries and products. The SUT reconciliation is first completed around 18 to 24 months after the reference period. For example, fully balanced estimates for 2020 were published for the first time in September 2022.

For those periods that have not yet been through the supply and use process, we use a [transparent framework](#) to manage this balancing process at an aggregate level, whereby we apply adjustments to GDP components. These adjustments reflect the relative strengths and weaknesses of the components and the information available at that time.

Each quarter, we publish the latest estimates for the economy within our [GDP first quarterly estimate publication](#). Currently this means that:

- only data up to the last supply and use balanced year (2020) have been fully reconciled using the annual SUTs framework, covering up to the end of 2020
- data from Quarter 1 (Jan to Mar) 2021 to Quarter 2 (Apr to June) 2022 are balanced from all three approaches to produce an average – that is, the headline GDP figure reflected the average growth rates of the output, income and expenditure measures
- data for Quarter 3 (Jul to Sept) 2022 onwards are led by the output approach with expenditure and income balanced to produce headline GDP – the headline GDP figure reflects the output growth rate, to which income and expenditure are balanced

Our [previous analysis, published 22 August 2022](#), describes how the coronavirus (COVID-19) pandemic has led to challenges in the balancing of the early estimates of GDP in 2020, with larger revisions in 2020 as a result. As part of Blue Book 2023, we now have brought together the three approaches to measuring GDP in 2021 for the first time using the SUTs framework such that, in the September 2023 Quarterly National Accounts:

- data up to the last supply and use balanced year (2021) will now be reconciled using the annual SUTs framework – there is one single estimate for all periods that have been fully balanced, which covers up to the end of 2021
- data from Quarter 1 (Jan to Mar) 2022 to Quarter 4 (Oct to Dec) 2022 will be balanced from all three approaches to produce an average – that is, the headline GDP figure reflects the average growth rates of the output, income and expenditure approaches
- data for Quarter 1 (Jan to Mar) 2023 onwards will be led by the output approach with expenditure and income balanced to produce headline GDP – the headline GDP figure reflects the output growth rate, to which income and expenditure are balanced

As a result of changes to the level of annual GDP for those years, the GDP quarterly and monthly path will also be revised to ensure alignment to the new annual levels.

### 4 . Impact of Blue Book 2023 on current price GDP

## Annual revisions to average current price gross domestic product (GDP)

Figure 1 shows the indicative revision to annual current prices GDP growth from 1998 to 2021. Throughout this article, quarterly data labelled "Blue Book 2022" has been taken from the latest [Quarterly National Accounts](#). As explained in our [previous publication, published in July 2023](#), current price data between 1998 and 2020 sees minor revisions.

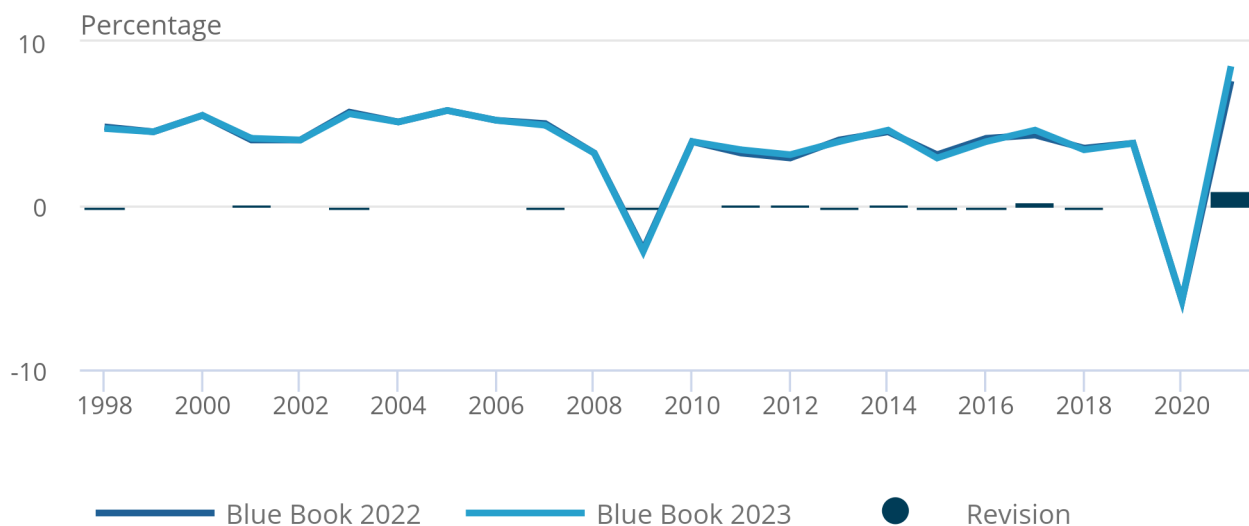
In 2021, though, current price GDP is now estimated to have increased by 8.5%, revised up 0.9 percentage points. This follows an unrevised fall of 5.8% in 2020.

### Figure 1: Current price GDP in 2021 is now estimated to have grown by 8.5%

UK, current price GDP growth, 1998 to 2021

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UK, current price GDP growth, 1998 to 2021



Source: UK National Accounts from the Office for National Statistics

Alongside confronting the three approaches to measuring GDP for the first time through the supply and use table (SUT) framework, we have also incorporated richer data across a number of GDP components. For example, in the income approach, compensation of employees sees downward revisions in 2021 following the availability of updated HMRC PAYE RTI data for the financial year 2021 to 2022, which has been incorporated for the first time for wages and salaries.

## Quarterly revisions to current price GDP

Figure 2 shows the revisions to the quarterly profile of current price GDP growth from Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2019. Because of the larger movements during the coronavirus (COVID-19) pandemic, the 2020 and 2021 quarters have been shown separately in Table 1.

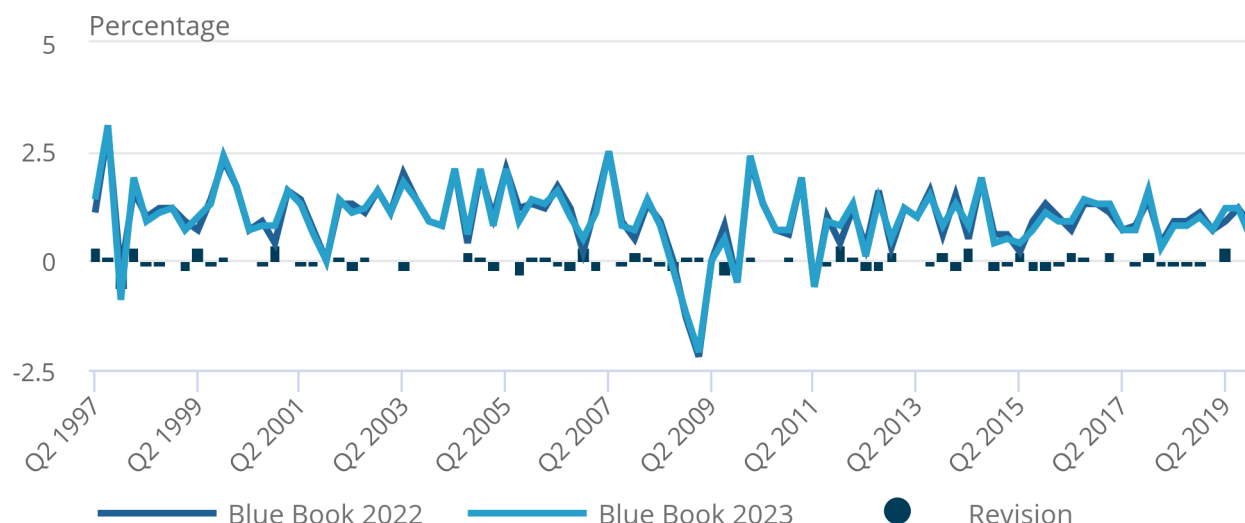
Over the time period Quarter 2 1997 to Quarter 4 2019, there is a mean absolute revision of 0.1 percentage points.

### Figure 2: There have been modest revisions to current price GDP growth for the period between 1997 and 2019

UK, current price GDP growth, UK, Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2019

#### Figure 2: There have been modest revisions to current price GDP growth for the period between 1997 and 2019

UK, current price GDP growth, UK, Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2019



Source: UK National Accounts from the Office for National Statistics

Table 1 shows the revisions to the quarterly profile of current price growth across 2020 and 2021; overall the quarterly profile through the years is relatively little changed. Heightened levels of uncertainty have led to larger revisions in 2020 and 2021 although, the size of the quarterly movements needs to be considered for context.

Table 1: Current price quarterly GDP growth in 2020 and 2021  
 UK, current price GDP growth, UK, Quarter 1 (Jan to Mar) 2020 to Quarter 4 (Oct to Dec) 2021

	<b>Planned to be published in Blue book 2023 (%)</b>	<b>Blue book 2022 (%)</b>	<b>Revision (percentage points)</b>
<b>Q1 2020</b>	-1.7	-1.4	-0.3
<b>Q2 2020</b>	-14.5	-15	0.5
<b>Q3 2020</b>	12.2	12.3	-0.1
<b>Q4 2020</b>	0.9	1.0	-0.1
<b>Q1 2021</b>	-0.1	-0.3	0.2
<b>Q2 2021</b>	5.6	4.5	1.1
<b>Q3 2021</b>	2.4	2.7	-0.3
<b>Q4 2021</b>	2.6	2.7	-0.1

Source: UK National Accounts from the Office for National Statistics

#### Notes

1. Estimates for Blue Book 2023 are based on the latest available information and are subject to revision as firmer data becomes available.

## 5 . Impact of Blue Book 2023 on volume GDP

## Annual revisions to volume gross domestic product (GDP)

As shown in our [methodology published in July 2023](#), data between 1998 and 2019 are expected to be largely unchanged compared with our Blue Book 2022 estimates. The majority of the revisions follow directly from the changes to current price growth described earlier in this article.

In 2020, average volume GDP is now estimated to have fallen by 10.4%, revised up by 0.6 percentage points (Figure 3). This upward revision reflects both updated data and methods changes. Measurement of inventories is challenging over this time period; the changes in the inventories component is now estimated to have increased by £2.5bn in 2020 (previously this was a £11.4bn fall).

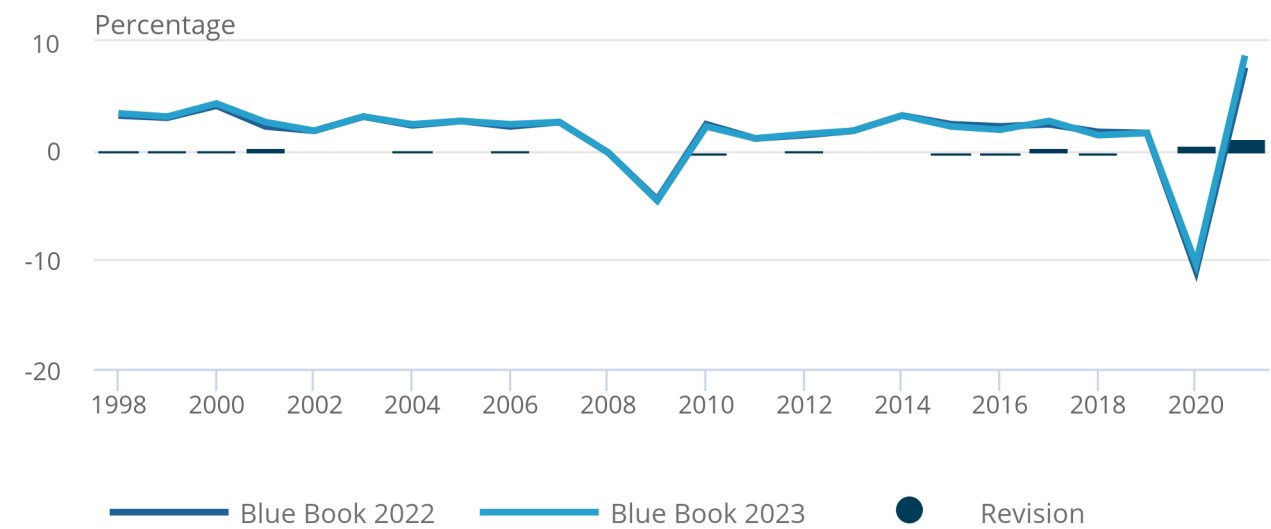
In 2021, average volume GDP is now estimated to have increased by 8.7%, revised up from a previous estimate of 7.6% (Figure 3). Alongside confronting the three approaches to measuring GDP for the first time through the supply and use table (SUT) framework, we have also incorporated richer data across a number of GDP components. For example, in the expenditure approach, household consumption sees upwards revisions in 2021 because of better information available on areas such as Telecoms.

**Figure 3: Annual volume GDP is now estimated to have increased by 8.7% in 2021**

UK, volume GDP growth, 1998 to 2021

Figure 3: Annual volume GDP is now estimated to have increased by 8.7% in 2021

UK, volume GDP growth, 1998 to 2021



Source: UK National Accounts from the Office for National Statistics

## Quarterly revisions to volume GDP

Over the time period Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2019, the revisions to individual quarters range from negative 0.3 to positive 0.2 percentage points, with a mean absolute revision of 0.01 percentage points (Figure 4). These revisions are in line with recent historical Blue Book revisions as shown in our [previous article, GDP revisions in Blue Book: 2022](#).

Quarterly volume GDP growth over the period Quarter 2 1997 to Quarter 4 2007 sees an average 0.03 percentage point downward revision. For the period Quarter 1 (Jan to Mar) 2010 to Quarter 4 2019, quarterly volume GDP growth is on average unrevised.

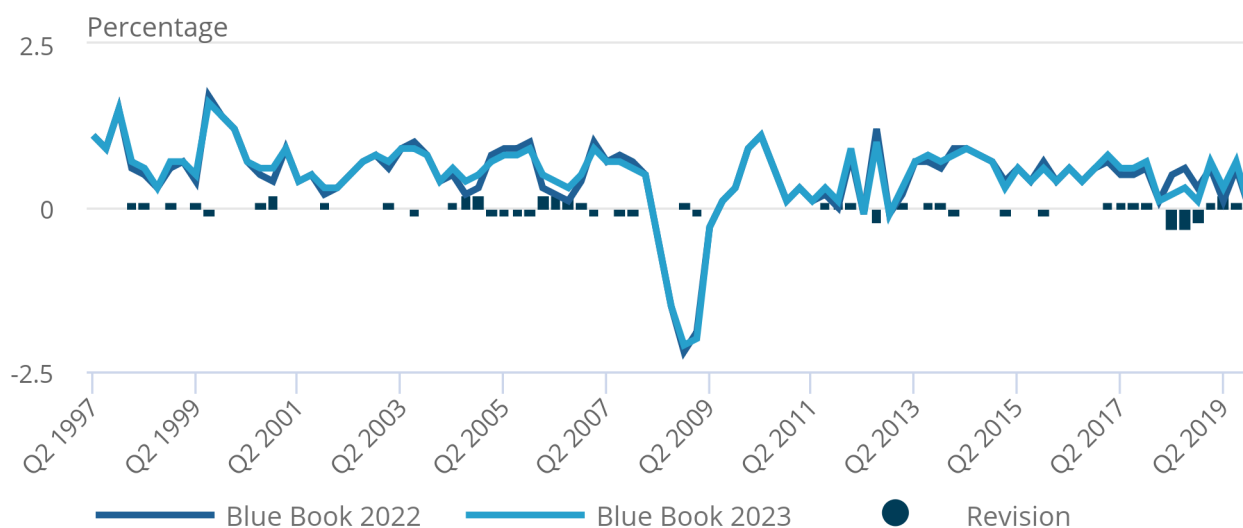
The [peak-to-trough](#) (as explained in our [Communicating the UK Economic Cycle methodology](#)) of the 2008 to 2009 economic downturn has been revised down to negative 6.4% (previously negative 6.3%). The peak-to-trough quarters (Quarter 1 2008 to Quarter 2 2009) are unchanged. GDP returned to the pre-economic downturn levels in Quarter 3 (July to Sept) 2013, this has been revised from a previous estimate of Quarter 2 2013.

**Figure 4: Quarterly volume GDP growth sees minor revisions between 1997 and 2019**

UK, volume GDP growth, UK, Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2019

### Figure 4: Quarterly volume GDP growth sees minor revisions between 1997 and 2019

UK, volume GDP growth, UK, Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2019



Source: UK National Accounts from the Office for National Statistics

Because of the large movements during the coronavirus (COVID-19) pandemic, the 2020 and 2021 quarters have been shown separately in table 2. Heightened levels of uncertainty because of the unprecedented shock of the coronavirus pandemic have led to larger revisions in these quarters as the substantial changes in the rate of economic growth are more difficult to measure with the same level of precision as smaller changes during more “normal” times. The size of the revision should also, of course, be considered in the context of the magnitude of the change in the growth rates.



Table 2: Volume quarterly GDP growth in 2020 and 2021  
 UK, volume GDP growth, UK, Quarter 1 (Jan to Mar) 2020 to Quarter 4 (Oct to Dec) 2021

	<b>Planned to be published in Blue book 2023 (%)</b>	<b>Blue book 2022 (%)</b>	<b>Revision (percentage points)</b>
<b>Q1 2020</b>	-2.7	-2.6	-0.1
<b>Q2 2020</b>	-20.3	-21.0	0.7
<b>Q3 2020</b>	16.8	16.6	0.2
<b>Q4 2020</b>	1.4	1.2	0.2
<b>Q1 2021</b>	-1.0	-1.1	0.1
<b>Q2 2021</b>	7.3	6.5	0.8
<b>Q3 2021</b>	1.7	1.7	0.0
<b>Q4 2021</b>	1.5	1.5	0.0

Source: UK National Accounts from the Office for National Statistics

#### Notes

1. Estimates for Blue Book 2023 are based on the latest available information and are subject to revision as firmer data becomes available.

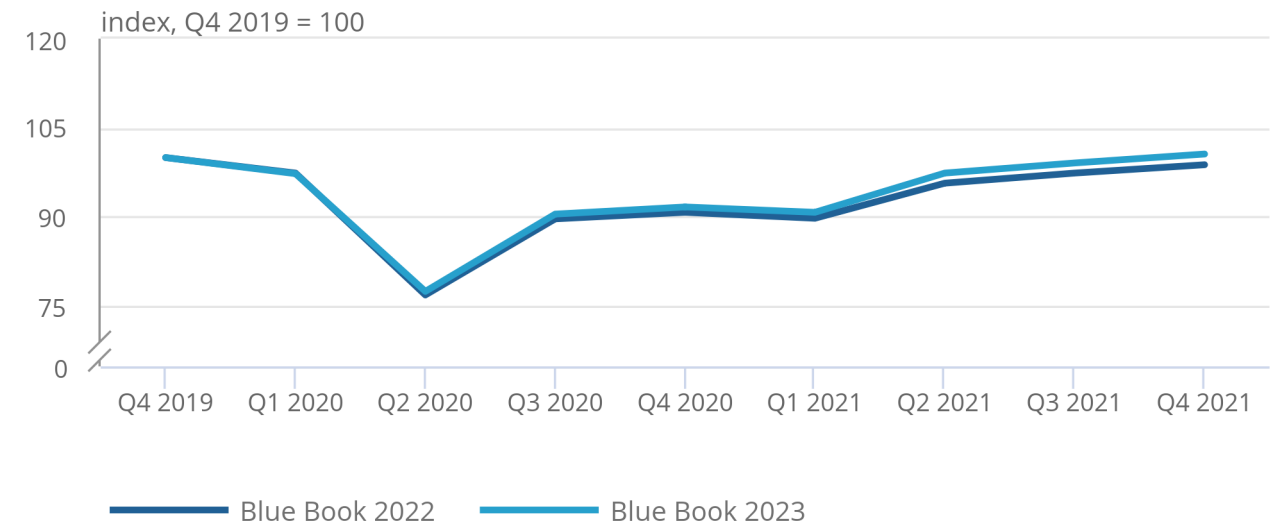
Upward revisions to 2020 and 2021 mean that the level of UK real GDP in Quarter 4 2021 is now higher compared with previously published. The level of quarterly GDP in Quarter 4 2021 is now estimated to be 0.6% above its pre-coronavirus (COVID-19) level (Quarter 4 2019), this was previously estimated as 1.2% below. Quarter 4 2021 is the first quarter during which the UK exceeds its pre-pandemic level.

**Figure 5: The level of UK real GDP in Quarter 4 2021 is now estimated to be 0.6% above its pre-coronavirus pandemic (Quarter 4 2019) levels**

UK, Quarter 4 2019 (Oct to Dec) to Quarter 4 2021

Figure 5: The level of UK real GDP in Quarter 4 2021 is now estimated to be 0.6% above its pre-coronavirus pandemic (Quarter 4 2019) levels

UK, Quarter 4 2019 (Oct to Dec) to Quarter 4 2021



Source: UK National Accounts from the Office for National Statistics

## 6 . Impact of Blue Book 2023 on the GDP implied deflator

As shown in our [methodology, published in July 2023](#), Blue Book 2023 will contain a number of changes to existing deflators. These revisions are because of the impact on current prices of some of the improvements being made and volume impacts from deflator improvements.

The annual average growth of the implied deflator between 1998 and 2019 will remain at 2.0%, unchanged from the Blue Book 2022 average.

In 2020 the average gross domestic product (GDP) implied deflator growth is 5.1%, downwardly revised 0.8 percentage points. This is influenced by upward volume revisions in 2020. The 2021 average GDP implied deflator is now estimated to have fallen slightly by 0.1%, revised down from a previous estimate of no growth.

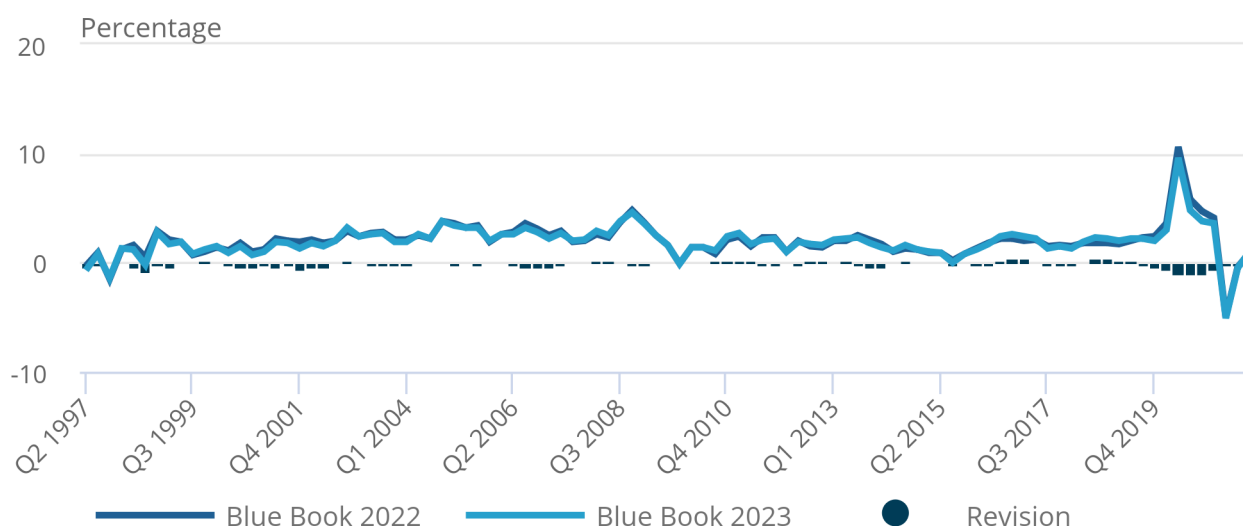
The implied GDP deflator represents the broadest measure of inflation in the domestic economy, reflecting changes in the price of all goods and services that comprise GDP. It is important to note that the GDP deflator covers the whole of the domestic economy, not just consumer spending, and also reflects the change in the relative price of exports to imports. For more information on the implied GDP deflator, see our [Measuring price changes of the UK national accounts: February 2023 article](#).

**Figure 6: The GDP implied deflator growth in 2020 and 2021 is now weaker because of upwardly revised volume estimates**

UK, GDP implied deflator quarter on quarter a year ago growth, UK, Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2021

Figure 6: The GDP implied deflator growth in 2020 and 2021 is now weaker because of upwardly revised volume estimates

UK, GDP implied deflator quarter on quarter a year ago growth, UK, Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2021



Source: UK National Accounts from the Office for National Statistics

## 7 . Measuring gross value added (GVA) and the importance of intermediate consumption

The production approach, or GDP (P) as it is often known, is primarily concerned with the generation of gross value added (GVA). In other words, the value of all goods and services produced within the economy. To derive estimates of GVA we require information on output and intermediate consumption such that:

$$\text{Gross value added} = \text{Output} - \text{Intermediate consumption}$$

where:

- output – goods and services that are produced within a sector that are available for purchase outside of that sector
- intermediate consumption – value of goods and services purchased to be used up in the production of goods and services, for example, raw materials such as flour in bread-making, ink and paper in printing; specifically excludes staff costs and capital investments, which are handled elsewhere in the accounts

In the context of GDP, we are generally most interested in growth between periods. An increase in output between periods (other things equal) causes gross value added to rise, while an increase in intermediate consumption similarly causes value added to fall. When output and intermediate consumption move in opposite directions, the resulting growth or decline in gross value added can be quite large in percentage terms. For example, a fall in output coupled with a rise in intermediate consumption will cause a stronger fall in value added than one of these two movements alone.

Since the integration of [double deflation](#) and extension of supply and use tables (SUTs) in volume estimates into the [National Accounts estimates in September 2021](#), monthly and quarterly industry-level current price (CP) and chained volume measures (CVM) estimates are benchmarked to their annual GVA estimates as part of the annual supply and use balancing process. In our [current published estimates](#), the CP and CVM data are benchmarked up to the last supply and use balanced year, which is 2020.

Data from after the supply and use process, that is currently for 2021 onwards, are created using the short-term measures of output only. Most indicators in the short-term measures are measuring changes in turnover and output as a proxy for changes in GVA; therefore, we assume that the intermediate consumption ratio by industry in 2020 held constant into 2021 and onwards, in other words, input costs as a proportion of turnover or output remain fixed.

As part of our Blue Book 2023 update, we now have actual estimates of intermediate consumption and industry-level GVA for 2021 as we have used the SUT framework to estimate GDP. Capturing this change between intermediate consumption and output is particularly important in 2021 as, if the ratio between intermediate consumption and output is higher in 2021 than in 2020, then this would lead to a subsequent downward revision in current prices, resulting in lower GVA, as well as the other way around. Industry-level estimates from within the SUTs framework are much richer than those in our industry short-term volume estimates. This not only reflects that a wider range of annual surveys and administrative information are used, but it also estimates GVA directly, rather than turnover as a proxy indicator.

We now see revisions to our estimates for the annual current price and volume data in 2021, not only because of the new methodology and data improvement, as explained in our [June 2023 article](#), but also because:

- the annual SUTs have much richer information from the Office for National Statistics (ONS's) annual structural surveys, such as the Annual Business Survey (ABS) and the Annual Purchases Survey
- these structural surveys and other sources provide an explicit measure of intermediate consumption and output to derive GVA
- the three approaches to measuring GDP in current and previous years prices are brought together through the SUT framework
- deflation takes place at a far more detailed level, for each transaction and product, followed by bringing these deflated estimates together in the supply-use framework, to produce double-deflated estimates of gross value added for industries

As a result of changes to the level of annual GVA, the quarterly and monthly path will also be revised to align to the new annual levels. The annual impacts for the industries are explored in the following sections, for full information on the monthly breakdown of GDP, please refer to the [accompanying dataset](#).

## **8 . Indicative industry impacts for volume estimates**

## The services sector

For the period 1998 to 2019, annual volume services growth sees an average 0.1 percentage point revision to growth.

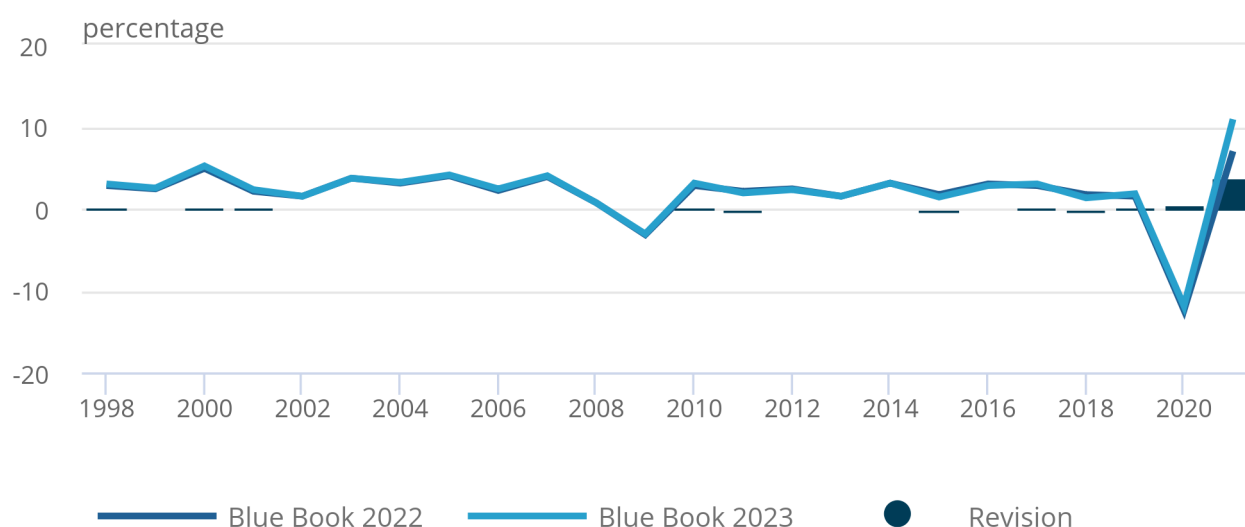
In 2021, the services sector is now estimated to have grown by 10.9%, revised up by 3.9 percentage points. Annual services growth has also been revised up in 2020 by 0.5 percentage points.

**Figure 7: Annual volume estimates of services sees higher output in 2021**

UK, annual volume growth in services, 1998 to 2021

### Figure 7: Annual volume estimates of services sees higher output in 2021

UK, annual volume growth in services, 1998 to 2021



**Source: UK National Accounts from the Office for National Statistics**

There are several services subsectors that see minimal revision in 2021, despite the large changes in the economy taking place in 2021. Two examples are accommodation and food services (revised from 30.9% growth in 2021 previously to 31.3% now) and professional, scientific and technical activities (9.9% growth in 2021 previously, 9.8% now).

The largest contribution to the revision in 2021 is from the wholesale and retail trade; repair of motor vehicles and motorcycles subsector, which contributed 1.9 percentage points to the upward revision. These were influenced by wholesale and retail trade, excluding motor vehicles, contributing 1.4 and 0.6 percentage points to the annual services revision in 2021, respectively.

This revision arises from the more detailed method for estimating distributor trading margins in the annual supply and use process compared with deflated turnover used in our earlier estimates. The overall increase in the volume of goods sold by wholesalers and retailers between 2020 and 2021 leads to growth in the volume of margins generated by those businesses. More details on how we estimate volumes of distributor trading margins, which help determine volume estimates of retail and wholesale, can be found in our article on [Double deflation methods and deflator improvements to UK National Accounts](#).

In Blue Book 2023, the retail trade volume GVA increased by 10.8% in 2021. This was a revision from the previously published estimate where, based on using deflated turnover as a proxy for GVA, volume GVA increased by 1.5% in 2021. Throughout 2021, more people were able to use retail services than 2020 because of the easing of restrictions. In particular, the retail of clothing and textiles saw a strong recovery in 2021.

The implied price of retail services increased substantially in 2020, and (in contrast to wholesale trade) remained at a higher level in 2021, possibly reflecting the greater use of home delivery services.

In Blue Book 2023, wholesale trade volume GVA increased by 32.4% in 2021. This was a revision from the previously published estimate where, based on using deflated turnover as a proxy for GVA, volume GVA increased by 2.7% in 2021. The latest data show the strong recovery in 2021 for the wholesale industry following the coronavirus (COVID-19) pandemic. The implied price of wholesale services was high in 2020, but it returned to similar levels to 2019 in 2021.

The second largest contribution to the revision in 2021 is from the human health and social work activities subsector, which contributed 1.2 percentage points to the upward revision, the main contribution to which came from the human health industry.

Between 2019 and 2020, the volume of human health services gross value added fell 42.5%. This reflected both a reduction in output, as the health service pivoted to deal with the coronavirus (COVID-19) pandemic and had to cancel much of its routine business, and an increase in intermediate consumption to adapt to the challenges in the pandemic. The impact of coronavirus on our human health estimates in 2020 was discussed in more detail in our [article on Blue Book 2022 impacts on 2020 GDP](#).

In 2021, the volume of human health services gross value added increased by 57.1%, recovering much of the previous fall. This was an upward revision from the previous estimate of 34.6% growth in volume gross value added, reflecting annual benchmark data on a wider range of health services, strength in the private sector, and the impact of the rapidly evolving relationship between output and intermediate consumption in the sector.

The volume of output rose by 30.1%, reflecting a recovery in "regular" health services, the continuation of testing and tracing activities, and the implementation of the vaccination rollout programme. Intermediate consumption continued at a higher level, rising 11.9% in volume terms, reflecting the ongoing costs of coping with the pandemic.

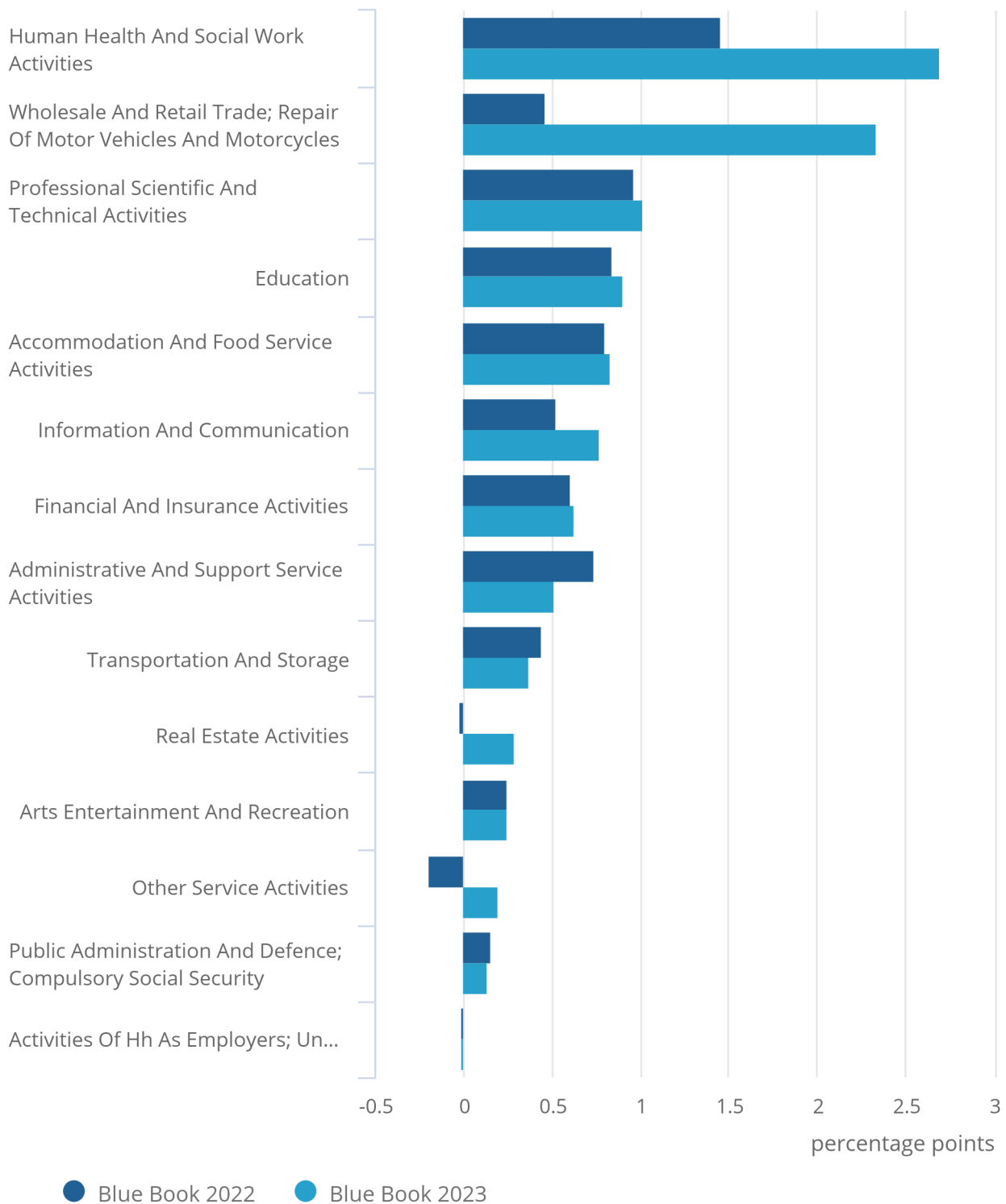
**Figure 8: Average annual volume services growth in 2021 is now stronger largely driven by the wholesale and retail trade; repair of motor vehicles and motorcycles subsector**

UK, components contribution to annual services volume growth in 2021, Blue Book 2023 compared with Blue Book 2022



## Figure 8: Average annual volume services growth in 2021 is now stronger largely driven by the wholesale and retail trade; repair of motor vehicles and motorcycles subsector

UK, components contribution to annual services volume growth in 2021, Blue Book 2023 compared with Blue Book 2022



Notes:

1. Sum of component contributions may not sum to total growth because of rounding.
2. Estimates for Blue Book 2023 are based on the latest available information and are subject to revision as firmer data become available.

In 2021, all of service sector sections are now estimated to have shown growth apart from activities of households as employers; undifferentiated goods and services of households for own use.

Consumer-facing services are now estimated to have grown by 11.1% in 2021 compared with our previous estimate of 5.7%. The largest contributions to this revision come from retail trade, followed by other personal services, which is now estimated to have grown by 8.0% in 2021 compared with our previous estimate of an 11.4% fall. The higher quality annual data sources after confrontation through the supply and use framework show output growth of 3.8%. This, combined with annual intermediate consumption data falling by 9.9%, result in the strong upwards revision to estimates of GVA in this industry.

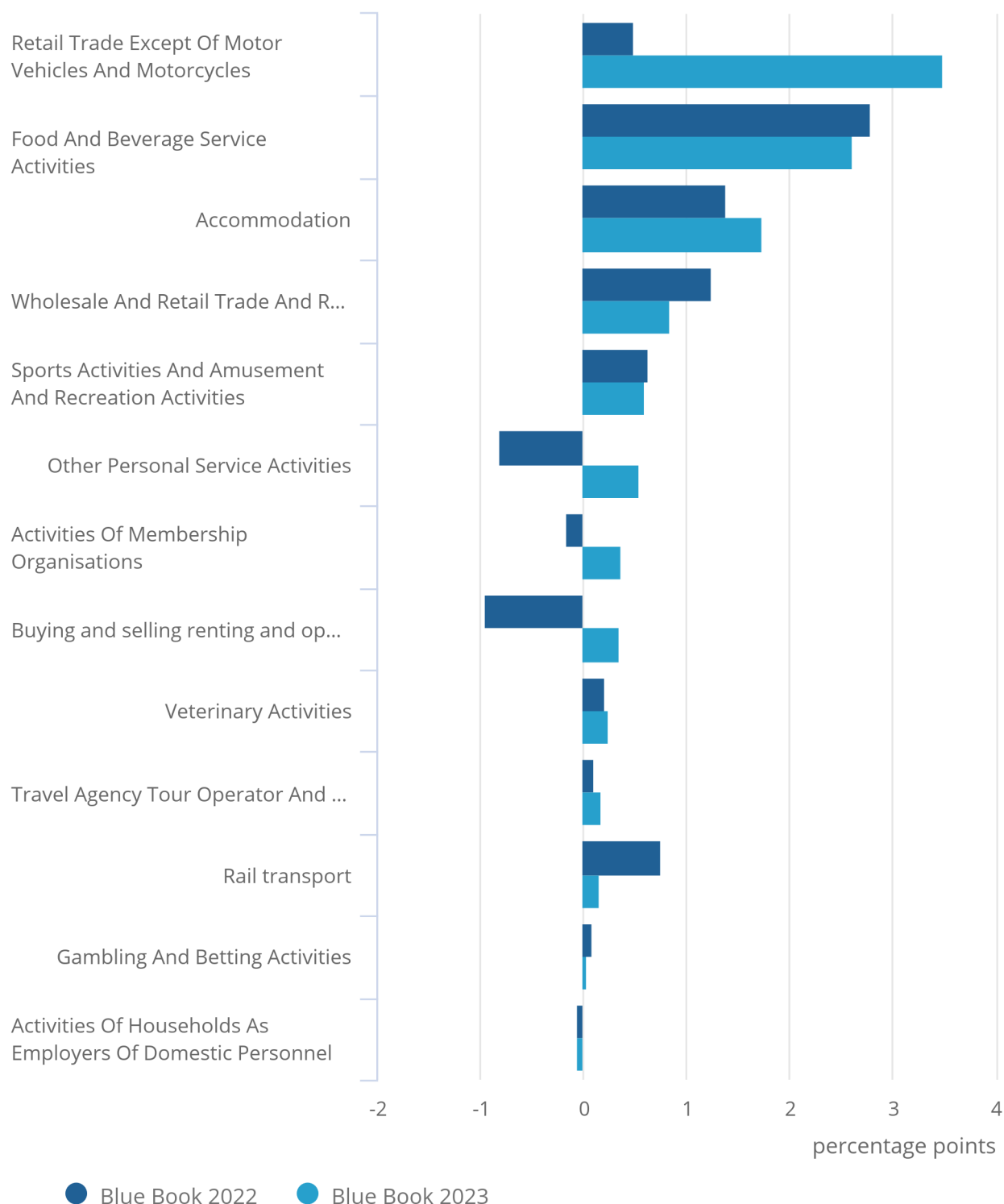
In December 2021, consumer-facing services are now estimated to be 8% below their pre-pandemic level (February 2020) compared with the previous estimate of 11.1% below.

**Figure 9: Consumer-facing services contributions to growth in 2021**

UK, components contribution to annual volume growth of consumer-facing services in 2021, Blue Book 2023 compared with Blue Book 2022

## Figure 9: Consumer-facing services contributions to growth in 2021

UK, components contribution to annual volume growth of consumer-facing services in 2021, Blue Book 2023 compared with Blue Book 2022



**Source: UK National Accounts from the Office for National Statistics**

**Notes:**

1. Sum of component contributions may not sum to total growth because of rounding.
2. Estimates for Blue Book 2023 are based on the latest available information and are subject to revision as firmer data becomes available

## The production sector

Annual volume growth over the period 1998 to 2019 sees an average 0.1 percentage points upwards revision (Figure 10). Over this period, the revisions range from negative 1.2 to positive 1.4 percentage points. In 2020, production growth has been revised up by 1.1 percentage points, from 1.2% to 2.3%.

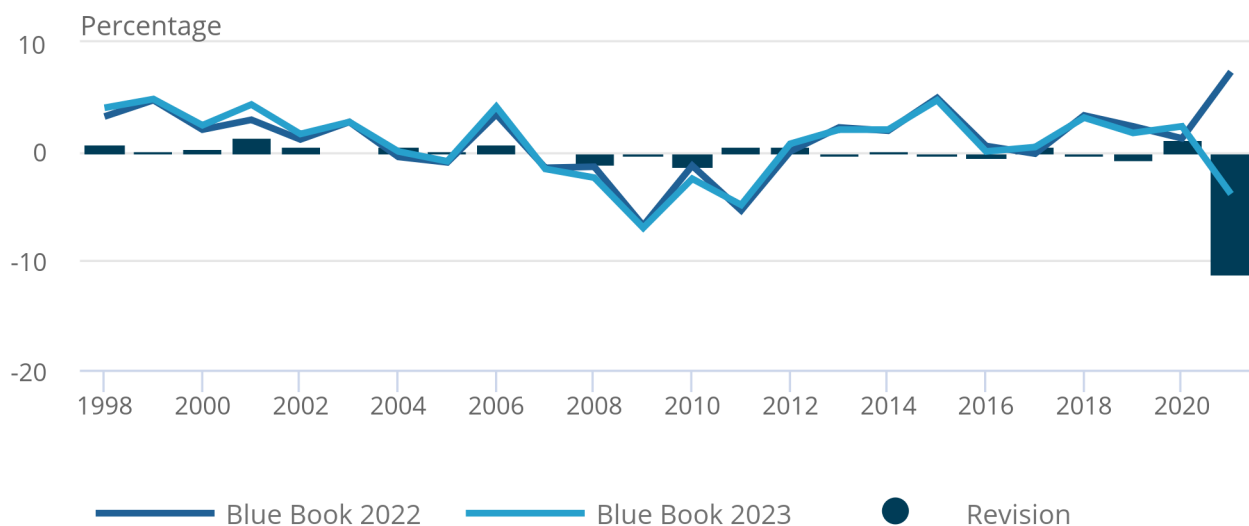
In 2021, output of the production sector is now estimated to have decreased by 3.9%, revised down from 7.3% growth.

**Figure 10: Annual volume estimates of production is now estimated to fall in 2021**

UK, annual volume growth in production, 1998 to 2021

### Figure 10: Annual volume estimates of production is now estimated to fall in 2021

UK, annual volume growth in production, 1998 to 2021



**Source: UK National Accounts from the Office for National Statistics**

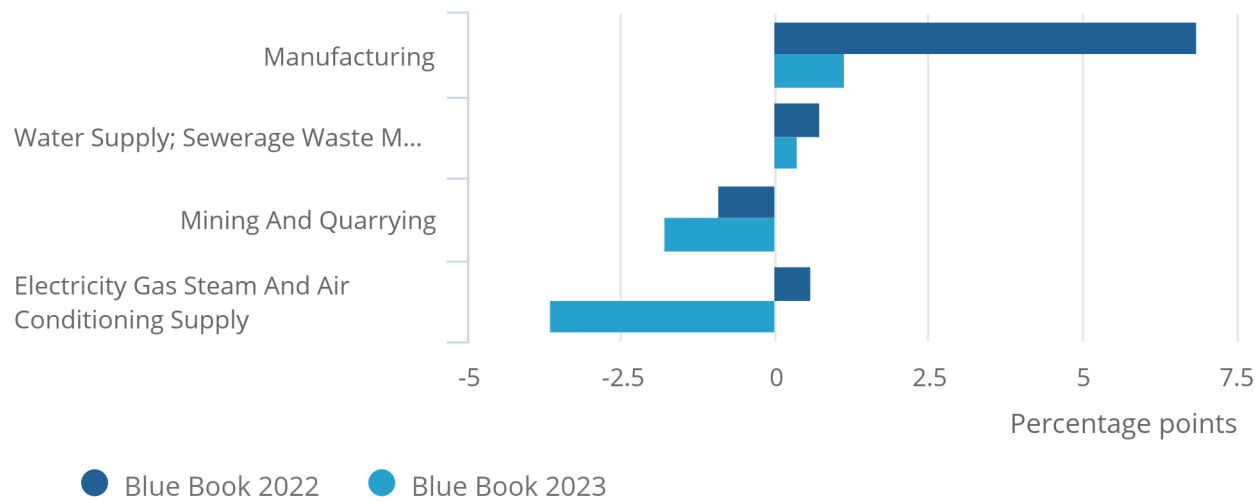
All four main production subsectors see downward revisions in 2021, with the largest contribution from the manufacturing subsector. Manufacturing output is now estimated to have increased by 1.6%, revised down from a previously published increase of 9.7%. The second largest contribution to the downward revisions came from electricity, gas, steam and air conditioning supply. This is now estimated to have fallen by 32.1%, revised down from a previously published growth of 5.1%. Both of these revisions are discussed in more detail in the rest of this section.

**Figure 11: All four subsectors of production see downward revisions, contributing to the fall in production in 2021**

UK, contribution to annual volume growth in production by sector, 2021

Figure 11: All four subsectors of production see downward revisions, contributing to the fall in production in 2021

UK, contribution to annual volume growth in production by sector, 2021



Source: UK National Accounts from the Office for National Statistics

Notes:

- 1. Sum of component contributions may not sum to total growth because of rounding.
- 2. Estimates for Blue Book 2023 are based on the latest available information and are subject to revision as firmer data become available.

## Case study: the electricity, gas, steam and air conditioning supply industry

The electricity, gas, steam and air conditioning industries (SIC Section D, from here referred to as the energy industries) made a substantial downward contribution of 0.6 percentage points to GDP annual volume growth in 2021. These industries were previously estimated to have grown by 5.1% in 2021, but now show a fall of 32.1%.

The monthly and quarterly estimates of value added in the energy industries are based on data provided by the Department for Energy Security and Net Zero (DESNZ). The data source underpinning the estimate of "Electric power generation, transmission and distribution" is a monthly GVA index where an index of output value subtracts an index of costs to calculate a proxy measure of value added in the short-term. For "Manufacture of gas, distribution of gaseous fuels through mains and steam and air conditioning supply", monthly volume estimates of gas sent across the distribution network in gigawatt-hours (GWh) are used to estimate activity.

As with other industries, electricity, and gas distribution benefit from all the relevant data being confronted in the annual supply and use framework. It is particularly important to understand the relationship between energy industries and the supply of crude oil and natural gas. Notably the imports and exports of crude oil and natural gas, which are provided by HM Revenue and Customs. The ONS also makes use of data published by DESNZ on the supply and use of energy products to further support our estimates.

One of the most important factors in these industries is the rising cost of crude oil and especially natural gas, which are important inputs into the electricity and gas distribution industries. Wholesale gas prices increased substantially during 2021, particularly in the last quarter when consumption started to rise in the colder, darker months.

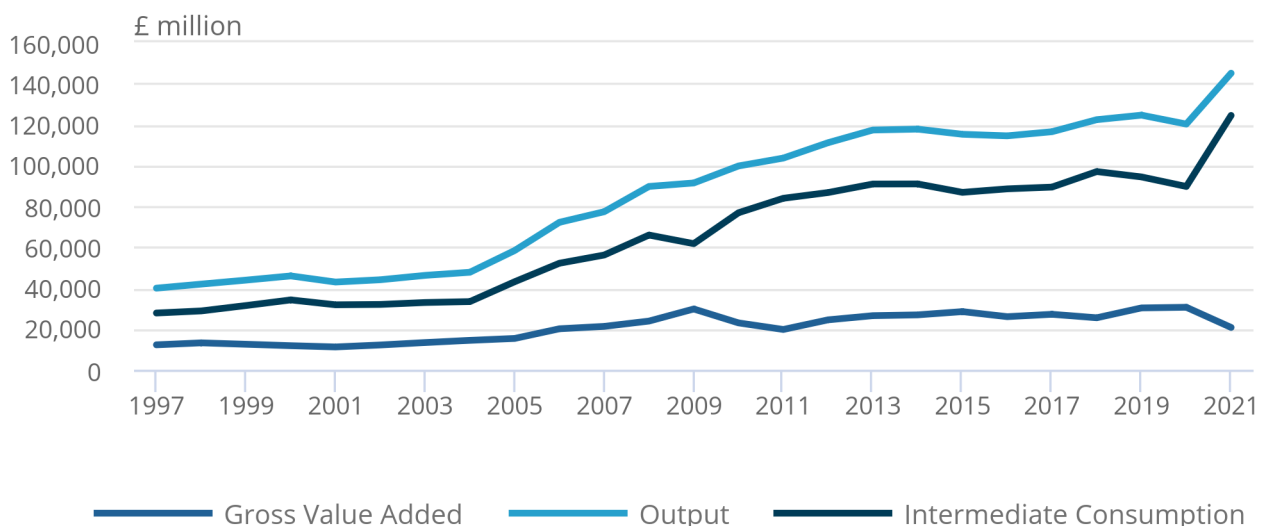
These results are shown in Figure 12. Output of the energy industries rose 20.7%, but intermediate consumption rose by 38.8%, resulting in a fall of current price gross value added of 32.3%.

**Figure 12: The rising cost of energy in 2021 led to a fall in gross value added (GVA)**

**Composition of gross value added of electricity, gas, steam and air conditioning supply (SIC Section D), current prices (£million)**

Figure 12: The rising cost of energy in 2021 led to a fall in gross value added (GVA)

Composition of gross value added of electricity, gas, steam and air conditioning supply (SIC Section D), current prices (£million)





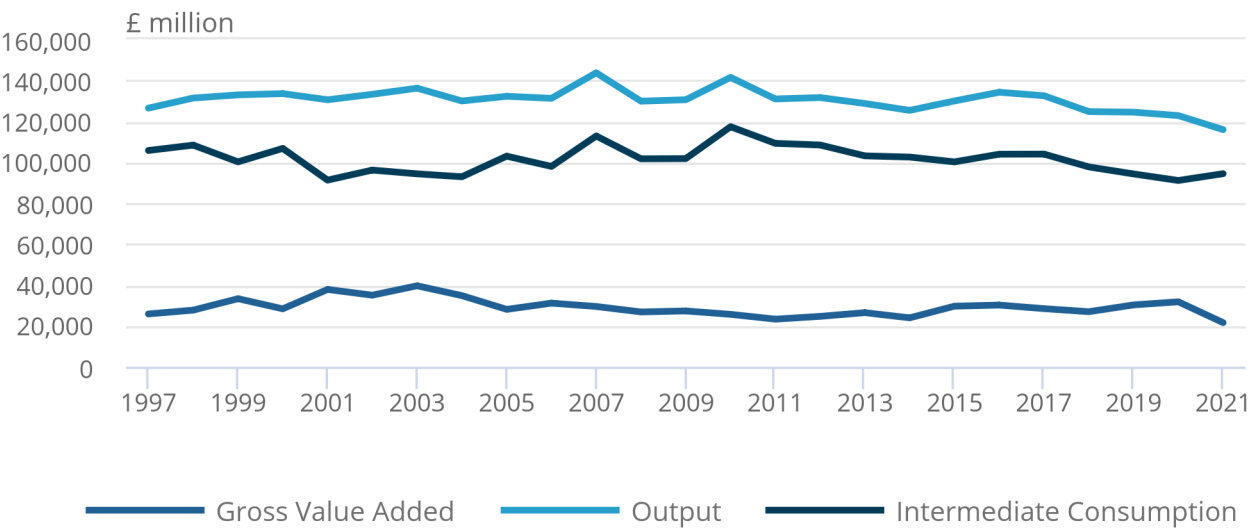
The impact on gross value added can also be seen in the volume estimates for the energy industries, as shown in Figure 13. The volume of energy industry output fell 5.6% into 2021, while the volume of intermediate consumption rose 3.6%. As discussed in Section 7, the combination of a small fall in output volume and a small rise in intermediate consumption leads to a substantial fall (32.1%) in gross value added.

**Figure 13: Volume estimates for energy fall in 2021**

Composition of gross value added of electricity, gas, steam and air conditioning supply (SIC Section D), chain volume measures (£million)

Figure 13: Volume estimates for energy fall in 2021

Composition of gross value added of electricity, gas, steam and air conditioning supply (SIC Section D), chain volume measures (£million)



Source: UK National Accounts from the Office for National Statistics

One possible explanation for the rise in intermediate consumption volume is that there has been a change in the products intermediately consumed by the energy industries, possibly reflecting a change in the energy mix. Measurement of intermediate consumption when the price of the most important input (crude oil and natural gas) is changing rapidly, is challenging, and will continue to be the subject of scrutiny by the ONS.

## Case study: The manufacturing subsector

Figure 14 shows the indicative components contributions to the manufacturing sector growth in 2021 that will be published in Blue Book 2023 compared with our currently published estimates.

As discussed earlier, there are several reasons why annual data differ from the early estimates. We have more detailed annual production data, and the first cut of survey data on intermediate consumption. This greater richness of data has allowed us to reconcile our data in the supply and use framework, first in current prices and then again after applying appropriate deflators to all transactions.

In particular, we now know that many manufactured goods experienced a slower recovery following the pandemic than previously estimated. For example, gross value added of metal manufacturing is now estimated to be weaker. Detailed confrontation of metal products has indicated that a greater proportion of the UK's need for manufactured metal products is instead being met by imports. Intermediate consumption increased in 2021 across most of the manufacturing sector, however the revisions to gross value added vary by industry.

We also know that manufacture of electrical equipment is now estimated to have decreased by 30.4% in 2021. The decrease in volume of gross value added is supported by the increased imports of electrical equipment and the increasing implied price of electrical equipment in 2021.

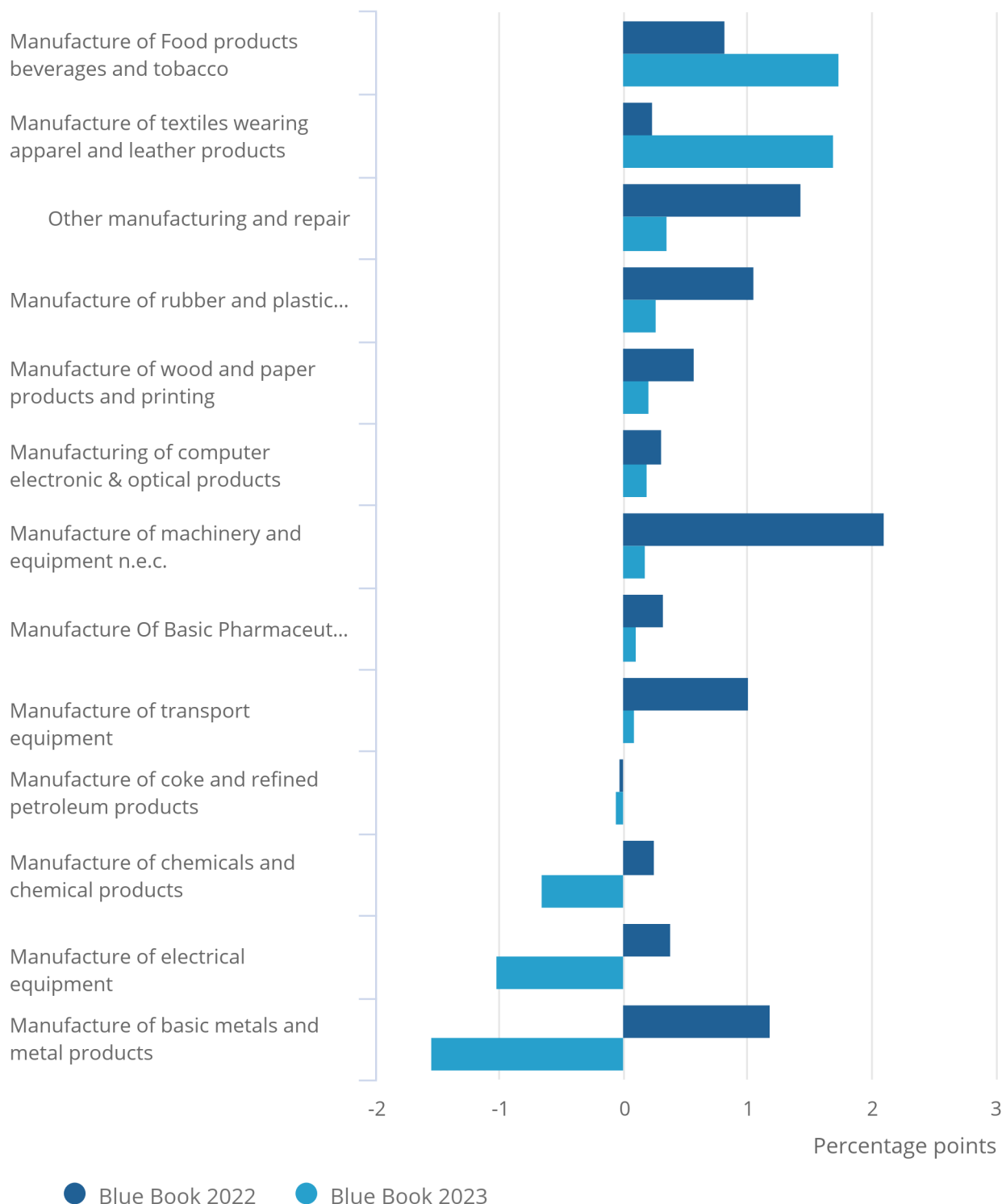
We can also see that textiles and clothing manufacturing showed a strong recovery following the pandemic with the latest estimate increasing by 78.6% in 2021. This is a revision up from a previously published 8.9% increase. This is supported by relatively weak imports and growth in household spending on clothing.

**Figure 14: The manufacturing subsector has seen downwards revisions in 11 out of the 13 subsectors**

UK, components contribution to annual manufacturing volume growth in 2020, Blue Book 2023 compared with Blue Book 2022

# Figure 14: The manufacturing subsector has seen downwards revisions in 11 out of the 13 subsectors

UK, components contribution to annual manufacturing volume growth in 2020, Blue Book 2023 compared with Blue Book 2022



Notes:

1. Sum of component contributions may not sum to total growth because of rounding.
2. Estimates for Blue Book 2023 are based on the latest available information and are subject to revision as firmer data become available

## The construction sector

Figure 15 shows the revisions to the annual profile of the construction sector. Annual volume growth over the period 1998 to 2019 sees an average negative 0.2 percentage-point downward revision. Over this period, the revisions range from negative 3.6 percentage points in 2010 to positive 0.5 percentage points in 2011. Growth in 2020 has been revised up by 0.9 percentage points.

The construction sector sees a downwards revision to volume growth in 2021 by 3.3 percentage points and is now estimated to have grown by 9.8% in 2021 compared with the previous estimate of 13.1%. The largest contribution came from weaker growth in value added by the civil engineering industry, informed by the fuller range of data available in annual balancing.

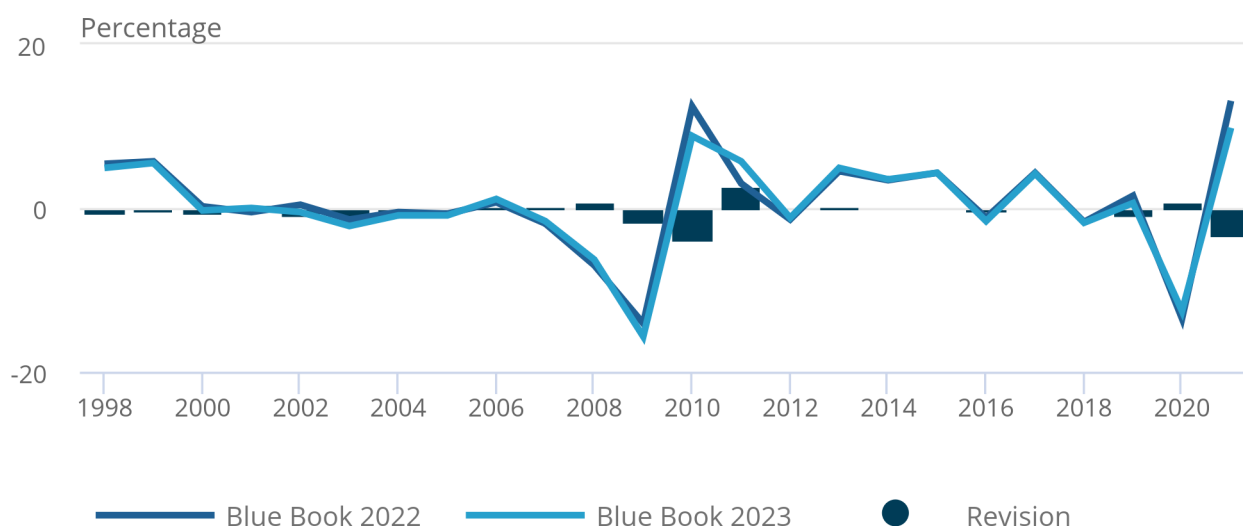
Our [August 2023 Construction output bulletin](#) only includes output data and therefore GVA estimates published in our [GDP releases](#) will be different from the construction output release.

**Figure 15: Annual volume estimates of construction sees weaker output in 2021**

UK, annual volume growth in construction, 1998 to 2021

### Figure 15: Annual volume estimates of construction sees weaker output in 2021

UK, annual volume growth in construction, 1998 to 2021



## Monthly pre-pandemic comparisons based on indicative Blue Book 2023 estimates

Table 3 shows that based on the indicative Blue book 2023 estimates, December 2021 monthly GDP, estimated by the output approach, is now 0.5% above its pre-pandemic level (February 2020). The main contribution to this comes from the service sector, which is 2.8% above its February 2020 level. However, production and construction are now estimated to be 10.0% and 2.1% below their February 2020 levels.

Table 3: Pre-coronavirus pandemic monthly comparisons  
UK, volume GDP growth, percentage change from February 2020 to December 2021

	Blue book 2023 (%)	Blue book 2022 (%)	Revision (percentage points)
<b>Monthly GDP</b>	0.5	-0.4	0.9
<b>Services</b>	2.8	-1.0	3.8
<b>Production</b>	-10	2.8	-12.8
<b>Construction</b>	-2.1	0.7	-2.8

Source: UK National Accounts from the Office for National Statistics

### Notes

1. Estimates for Blue Book 2023 are based on the latest available information and are subject to revision as firmer data becomes available.

## 9 . Indicative Blue Book 2023 impacts on labour productivity

Blue Book 2023 leads to relatively minor revisions in output per hour, our headline measure of productivity, and output per worker. In 2021, the upward revision to gross value added (GVA) for the whole economy in Blue Book 2023, comparing with Blue Book 2022, resulted in an upward revision to both output per hour and output per worker of the whole economy of 1.2 percentage points.

Figure 16 shows that 2021 year-on-year output per hour growth rate of 1.2%, published in the [output per hour worked dataset \(Productivity overview\)](#), was revised up to 1.7%.

The 2021 year-on-year output per worker growth rate of 8.2% in 2021, published in our [Output per worker dataset](#), as part of our Productivity overview, was revised up to 8.8%.

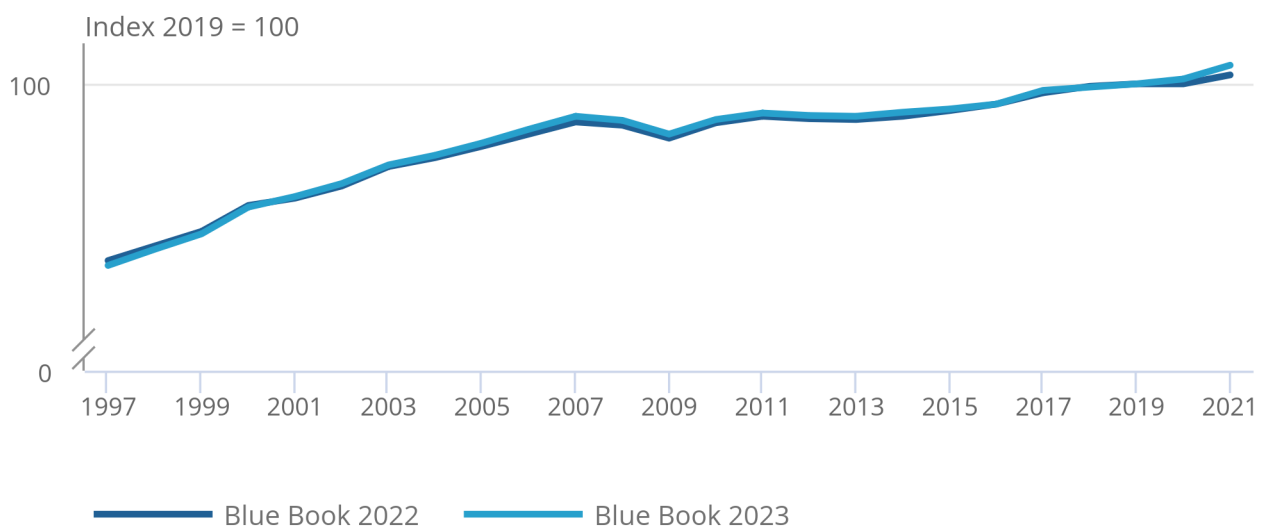
The updated Blue Book 2023 changes will be reflected in our next Productivity overview publication scheduled to be published in October 2023.

**Figure 16: Output per hour worked in 2021 is now higher because of upward revisions in gross value added**

UK, output per hour worked, index 2019 = 100, 1997 to 2021

Figure 16: Output per hour worked in 2021 is now higher because of upward revisions in gross value added

UK, output per hour worked, index 2019 = 100, 1997 to 2021



Source: UK productivity from the Office for National Statistics

## 10 . Next steps; publication and addition of 2022 to 2023 data

In Blue Book 2023, the Office for National Statistics (ONS) will make substantial improvements in measuring several aspects of the National Accounts. The introduction of the globalisation work in Blue Book 2023 moves us closer towards our objective of better capturing the impact of global supply chains. The introduction of a consistent framework for deflator usage and the data source and methodological changes in Blue Book 2023 continue to improve the quality of our National Accounts estimates. Alongside this, we will also include improved annual data as well as a full confrontation of data sources through the supply and use tables (SUTs) framework and application of double deflation; in particular for 2021.

We will publish further indicative impacts of Blue Book 2023 later in September. This will provide indicative annual impacts on the institutional [sector and accounts](#) and the [balance of payments estimates](#).

The next Quarterly National Accounts release on 29 September 2023 will incorporate these revisions into our official estimates in line with our [National Accounts Revision Policy](#).

This will incorporate the Blue Book 2023 methodological changes; improved source data and additional updated data as would happen in all quarterly national accounts releases. This also includes new Value Added Tax (VAT) turnover data for Quarter 4 (Oct to Dec) 2022 and Quarter 1 (Jan to Mar) 2023. As such, based on this new information we will also review the balancing of the three approaches to measuring GDP from 2022 onwards. These data changes are likely to lead to further revisions to the indicative estimates published in this article, as well as impacts for our pre-pandemic level recovery of GDP.

## 11 . Glossary

## 12 . Related links

### [Impact of Blue Book 2023 changes on current price and volume estimates of gross domestic product](#)

Article | Released 3 July 2023

Methodological and data improvements that affect current price and chain volume measure of gross domestic product (GDP), 1997 to 2020.

### [Globalisation in the Context of the UK National Accounts: Blue Book 2023](#)

Article | Released 3 July 2023

A summary of the guidance used in the measurement of globalisation in the UK National Accounts for Blue Book 2023

### [Impact of double deflation on industry chain volume measure annual estimates 1997 to 2018: Blue Book 2021](#)

Article | Released 28 June 2021

Indicative impacts of a new framework which will be implemented in Blue Book 2021, including the first official estimates of double-deflated gross domestic product.

### [Chain-linking in the UK National Accounts: Blue Book 2022](#)

Article | Released 20 June 2022

An explanation of the impacts the coronavirus (COVID-19) pandemic has had on the output and expenditure structures of the UK economy over this period. These affect how we compile volume estimates of gross domestic product (GDP) through chain-linking. Includes proposed changes we will be making to Blue Book 2022 in response to these impacts.



## 13 . Cite this article

Office for National Statistics (ONS), released 1 September 2023, ONS website, article, [Impact of Blue Book 2023 changes on gross domestic product](#)