

Article

# Introducing a new publication model for GDP

Upcoming changes to the GDP publication model. The new model is outlined, as well as the benefits and trade offs and the impact on data content.

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## Correction

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A correction has been made to section 4 under the subheading Impact of Income. This was due to a small error. You can see the original content in the superseded version. We apologise for any inconvenience.

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# 1 . Introduction

Office for National Statistics (ONS) will be introducing a new publishing model for gross domestic product (GDP) in July 2018. In summary, this model will give two (rather than three) estimates of quarterly GDP, and speed up the Index of Services publication by two weeks, enabling the publication of monthly GDP estimates.

This move was in response to recent findings that recommended that ONS should strive for timely GDP estimates to aid policy makers while maintaining a balance with the quality of data available, as well as efforts to produce a more coherent picture of the UK economy on a monthly basis.

Although there will be some loss in timeliness and data content, the improved quality of our quarterly estimates will make the data more reliable and hence lead to greater confidence in these estimates. Furthermore, the publication of monthly GDP estimates will consolidate the UK's position at the forefront of short-term GDP estimation.

This paper explains the motivation for the change to the publication model, its benefits and trade-offs, outlines the new products following from the change, and discusses other technical changes to how ONS compile GDP. The paper builds on the public [consultation](#) published in July 2017, providing further detail on the specifics of the new model.

## 2 . Overview of the current and new models

In the UK National Accounts, gross domestic product (GDP) is measured by the output, income, and expenditure approaches. These are conceptually equivalent to one another in value.

### Output

This is the value of the output of goods and services that are produced, less the intermediate inputs used in their production, plus any taxes net of subsidies on those products.

### Income

This records the value of income earned by households and businesses in the production of goods and services, plus any taxes net of subsidies on production and products.

### Expenditure

This is the value of the final expenditure on goods and services by households, businesses and the government, plus net exports of goods and services.

### Current model

The current GDP publication model has three releases per quarter. The first of these is the Preliminary estimate of GDP, released approximately 25 days after the end of the quarter to which it refers. Only output data is available for this estimate, with a data content of around 45%. Information for the final month of the reference quarter is largely forecasted, as less data tend to be available at this stage. Figure 1 shows that this is the fastest preliminary estimate that is published in the G7.

**Table 1: Timing of preliminary estimate of GDP (in days)**

Canada	France	Germany	Italy	Japan	US	UK
60	45	44	44	44	30	25

Source: OECD Understanding National Accounts, second edition

Approximately 55 days after the end of the preceding quarter the Second estimate of GDP is published, with a higher data content for output data and includes income and expenditure data. The overall data content across the different measures of GDP rises to around 65% in this vintage. The third estimate of GDP is released as part of the Quarterly National Accounts approximately 85 days after the end of the quarter. This estimate has increased data content for all three approaches, with an average data content of around 90%.

## New model

The move to a new publication model was supported by two reviews of economic statistics – [The Barker-Ridgeway National Statistics Quality Review](#) and [Sir Charles Bean's Independent Review of Economic Statistics](#) – which concluded that ONS should aim for timely GDP estimates while maintaining a balance with the quality of data available. The new model reconsiders the balance between the timeliness and accuracy of GDP estimates, with the aim of reducing the likelihood and frequency of revisions.

### Quarterly GDP

The new model will see the publication of two quarterly GDP releases rather than three. The new First quarterly GDP estimate will be published approximately 40 days after the end of the quarter to which it refers. The new first estimate will have much higher data content for the output approach than the current preliminary estimate. It will also contain data from the income and expenditure approaches, available to users two weeks earlier than in the current model. However, it should be noted that the data content for these measures will be lower than the current second estimate (see Figure 2). Although the new first estimate will be released two weeks after the current preliminary estimate, this is still in line with the release schedules of the G7 group of developed economies (see Figure 1). A fully comprehensive estimate of GDP will continue to be released as part of the Quarterly National Accounts, published 85 days after the end of the reference quarter alongside the Quarterly Sector Accounts and Balance of Payments. This will provide users with higher data content for output, income, and expenditure data, consistent with the current publication model.

### Monthly GDP

The change to the publication model also reflects an ONS initiative to release economic statistics according to “theme”, which will provide a coherent picture of the UK economy each month. The Index of Services release will be moved forward by two weeks, joining the publication of the Index of Production and Index of Construction (and UK trade) on a Short-term economic indicators (STEI) theme day. Taken together, these releases provide enough information to produce a monthly estimate of GDP, as data on almost the entire economy will now be available.

The STEI theme day will therefore include the release of monthly GDP estimates. This estimate will only include information on the output measure, as this is the timeliest of the three GDP measures and the only one available on a monthly basis. Although monthly growth rates will be made available, the releases will focus on the three-month growth rates as the headline indicator. This is because the monthly figure is likely to be more volatile, and so the three-month figure will be a better indicator of the underlying growth in GDP. In this sense, the monthly release can be thought of as a monthly update on three months' worth of data on the economy, rather than a figure representing the economy in just one month. The data in this release will contain three full months of survey data, therefore the data content will be fairly high.

The monthly estimate will be fully coherent with the first quarterly estimate of GDP, as both will be published on the same day in one month of each quarter. This is because the three months of output data used in the quarterly estimate will be the same data in the monthly publications, albeit with income and expenditure data. Moreover, the first quarterly estimate will be aligned to output for the two most recent quarters, ensuring consistency between the two releases (see later section Reconciling monthly and quarterly GDP).

## 3 . The trade-offs of the new model

### Timeliness versus accuracy

In response to [The Barker-Ridgeway National Statistics Quality Review](#) and [Sir Charles Bean's Independent Review of Economic Statistics](#), ONS have considered whether the quality of the preliminary estimate could be significantly improved if it were published with a slightly longer lag, enabling it to incorporate richer data. This reflects the trade-off between timeliness and accuracy – early estimates of gross domestic product (GDP) can only be based on incomplete information that is available at that time, with vintages of GDP having varying levels of data content for output, income, and expenditure. These reviews have identified the challenge of the limited availability of data in the early estimates of GDP, specifically whether sufficient information on the income and expenditure estimates is incorporated into the short-run estimates of GDP growth.

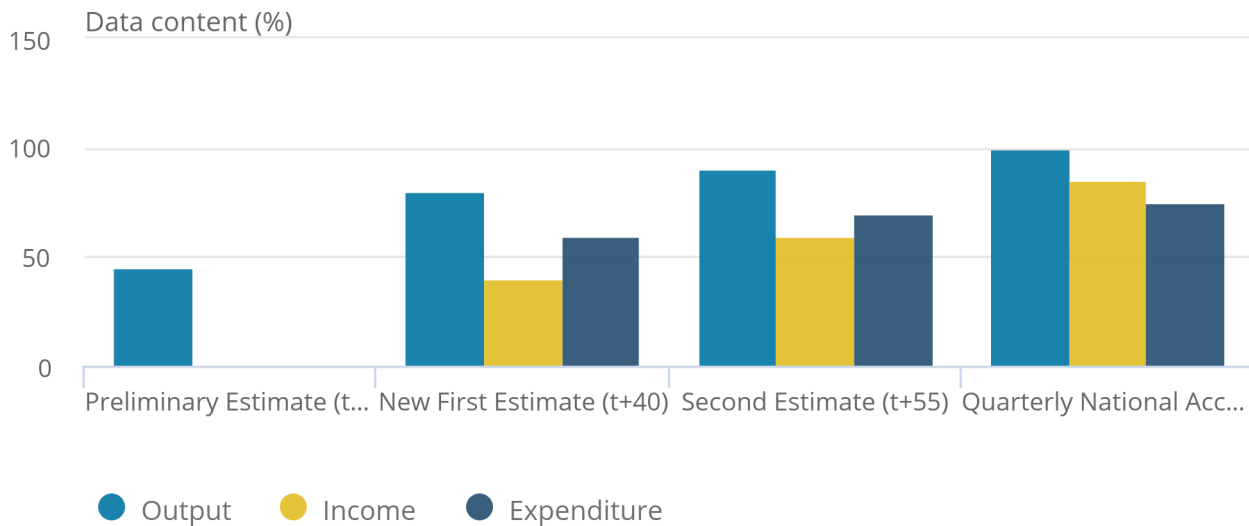
Under the current model, output data is given more weight than the two other approaches in the early estimates of GDP. This is because the output estimate has the strongest information at this stage, and therefore provides the best short-term picture of the economy. As such GDP growth is balanced to the output estimate in the latest quarter. As income and expenditure information becomes available for this quarter it is incorporated into the estimates of GDP, but GDP is still balanced to the output estimate of growth – alignment adjustments are applied to bring all three growth rates into line. This means information on income and expenditure in the UK tend not to have a material impact on the path of GDP until later in the balancing process.

Under the new model, the first estimate of quarterly GDP will now incorporate information from each of the output, income, and expenditure approaches. However, output will still be considered the best indicator of economic activity in the most recent quarter, and so GDP will still be balanced to output in our short-term estimates – particularly as its data content will now be significantly higher relative to the current preliminary estimate (see Figure 1). However, in contrast to the current preliminary estimate of GDP, any signals in the income and expenditure estimates can now be considered as part of the balancing process. We will use income and expenditure data in the quality assurance of the output measure, making quality and balancing adjustments to output data as appropriate. Furthermore, there will now be much more scope to pick up the effects of a sharp change in activity that takes place in the final month of the quarter, as actual data will now be available.

By delaying the first estimate of quarterly GDP by two weeks, we are able to incorporate income and expenditure data into our release two weeks earlier than this data was previously published. Although this estimate will still be balanced to output, this earlier insight of income and expenditure data will feed into the process and improve the quality of the estimate. Thus, although we will lose some timeliness in that our first quarterly GDP estimate will be delayed by two weeks, the benefit of having a more accurate estimate of GDP outweighs this. Therefore, we believe that the trade-off of reducing timeliness in exchange for a higher quality estimate is worthwhile.

**Figure 1: Data content of the current compared to new publication model**

Figure 1: Data content of the current compared to new publication model



Source: Office for National Statistics

## Reconciling monthly and quarterly GDP

Under the current publishing model, the top-level GDP estimate is an average of the growths from the three approaches to measuring GDP (output, income, and expenditure). This is the case for the period following the latest supply-use balancing process; until the data is fully balanced in this process this average GDP measure is used for top-level GDP. However, in the most recent quarter top-level growth is balanced to output gross value added (GVA). This is because we have greater confidence in the output approach given the higher data content at this stage.

Under the new publishing model, monthly GDP will have to use output GVA for its top-level growth as the other two measures are not available at this stage. Ideally, top-level GDP growth in the monthly releases would be the same as that published in the quarterly releases. However, it is not possible to produce an average GDP rolling three-month estimate without significantly distorting the underlying monthly data. Therefore, monthly GDP can only be based on output GVA growth. If we are unable to use average GDP for monthly GDP, then we must revisit which measure we use for top-level growth in quarterly GDP.

Not being able to produce an average measure of the monthly GDP estimate causes two challenges. Firstly, in the monthly releases, growth in the current and previous quarter are both output GVA. This allows for simple comparison. However, in the quarterly releases, the previous quarter would be aligned to average GDP. Having to compare average GDP to output GVA allows for the potential of different conclusions in our two releases.

Secondly, the three-month on three-month output GVA estimate in the monthly GDP release will be inconsistent with the average GDP-based quarterly estimates, which could result in unusual movements over the monthly time series. For example, the three months to January will need to be based on output GVA even though Quarter 4 (Oct to Dec) would usually be based on average GDP. This is because although we will have income and expenditure data for November and December, only output will be available for January; from this we cannot create average GDP for the three months. To some extent, the new revisions policy (see later section) will address this as, excluding February's first quarterly estimate (during which revisions for seasonal adjustment are taken on), the previous quarter in first estimates would never be revised (see below). However, for the first quarterly estimate in February, and QNA, there might be a difference between the monthly and quarterly release.

To ensure consistent reporting of the monthly and quarterly releases, average GDP will align to output in both the current and the previous quarter. This means that comparisons can be made between monthly releases and between monthly and quarterly releases. For example, when publishing our first quarterly estimate for Quarter 4, the top-level figure will be aligned to output for both Quarter 3 and 4. Aligning the previous quarter to output has minimal effect on the headline growth rate. It is also worth noting that our quarterly GDP estimates will still be aligned to average GDP, albeit one quarter later (Quarter 2 in the above example), and where we will now be aligning to output in the previous quarter, we will consider the higher content from income and expenditure in our quality assurance of the output measure – making quality and balancing adjustments to output data as appropriate.

## **Implications for other releases**

The new publication model will also have implications for releases associated with GDP. Firstly, to enable GDP balancing for the first quarterly estimate, the surveys that feed into the Construction Output, Index of Production, and UK Trade releases will need to close their data collection earlier for one month of each quarter, resulting in some loss of data content in initial short-term estimates of these components. Secondly, the Business investment provisional results release is currently published on the same day as the current Second estimate; in discussion with the users of the Business investment data we have decided that this release will only be published alongside the Quarterly National Accounts. However, an additional section on business investment will be published as part of the first quarterly estimate of GDP release.

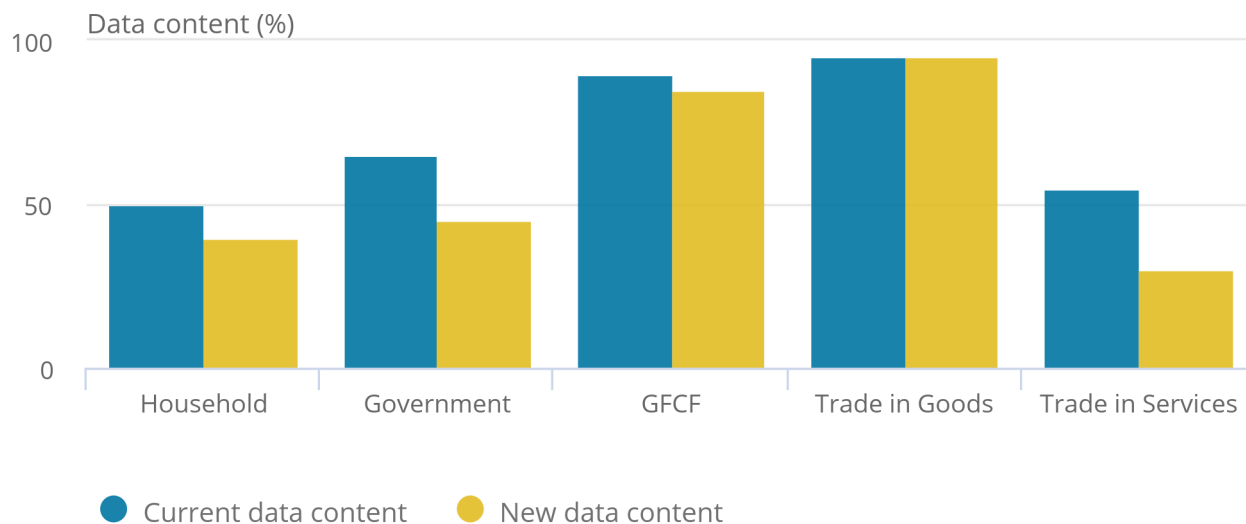
## **4 . Impact on data**

### **Impact on expenditure**

The new first estimate of quarterly GDP will introduce a lower expenditure and income content than the current Second estimate, which could affect the quality of early estimates of the components of these measures. The first estimates of the expenditure components of GDP will now be published around 40 days after the reference quarter, compared with 55 days under the current model, so the data content for these expenditure components will be lower (Figure 2).

**Figure 2: Data content of expenditure components of GDP**

Figure 2: Data content of expenditure components of GDP



**Source: Office for National Statistics**

Figure 3 shows the impact on data content for the components of the expenditure measure of GDP. The timelier publication may lead to larger revisions on these components. We are reviewing ways to counteract this reduction, such as the increase in the sample size for the International Trade in Services Survey, which should also help to reduce the scale of data revisions.

### Impact on output

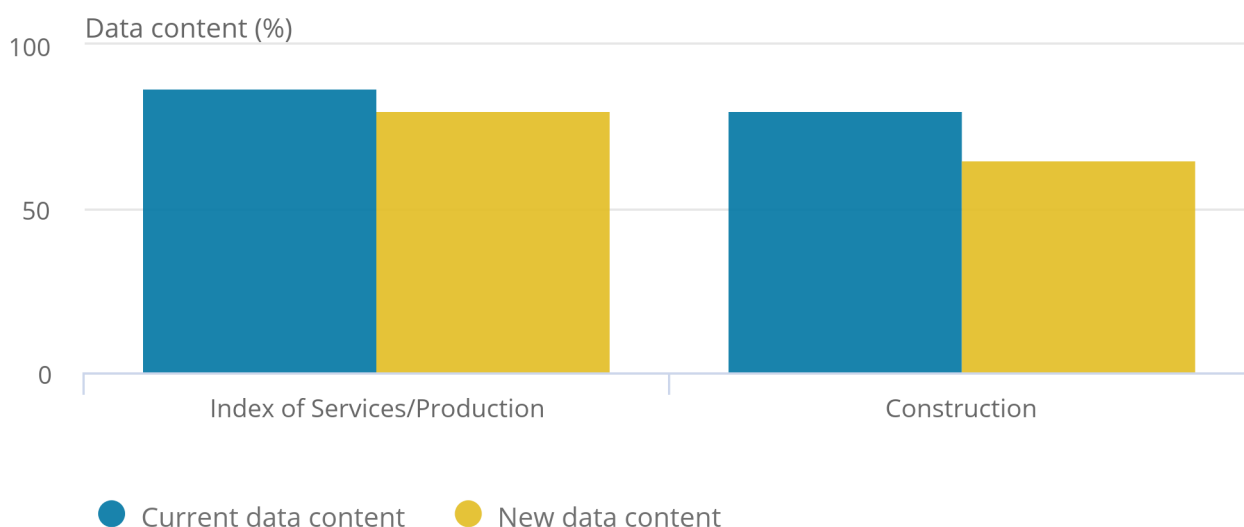
Estimates of production, construction, and services output are published every month, which feed into the quarterly estimates of GDP. Revisions to early estimates tend to reflect late survey returns, which are imputed if businesses have not responded in time. As these cannot be imputed with perfect foresight, it is likely that there will always be a difference between the imputation and the actual value returned late, leading to revisions. The new model will have no impact on the timing of the publication of production and construction. Only services will be affected, which will now be published approximately two weeks earlier as part of the move to Monthly GDP, although this earlier release will have a negligible negative impact on the quality of the services estimates as the loss of data content will be minimal.



However, data content in the estimates of these sectors is impacted in the month of each quarter in which the new First estimate of quarterly GDP is published. This is because the first time that output, income, and expenditure are now balanced will now take place approximately 40 days after the reference quarter, as opposed to 55 days currently. As such, data collection in these months (for example the Monthly Business Survey that is used for services, production and construction data) must finish earlier to allow additional time to balance all three measures. However, this data will be included in later vintages. Figure 4 shows the impact on the data content on these output estimates in the first estimate of quarterly GDP. It is important to note that the data content overall for the new first quarterly estimate is still much higher compared with the preliminary estimate, as comprehensive survey information is now available for the third month of that quarter.

**Figure 3: Data content of output components of GDP for the third month of each quarter**

Figure 3: Data content of output components of GDP for the third month of each quarter



Source: Office for National Statistics

Figure 3 illustrates the approximate reduction in Monthly Business Survey responses rates for production, construction and services data in the first quarterly estimate of GDP release. However, this reduction only applies to data from the third month of the quarter. Under the new model, the close in data collection for services and production will move forward by around three days resulting in a drop of approximately six percentage points, while data freeze for construction will move forward by five days resulting in a drop of approximately 15 percentage points.

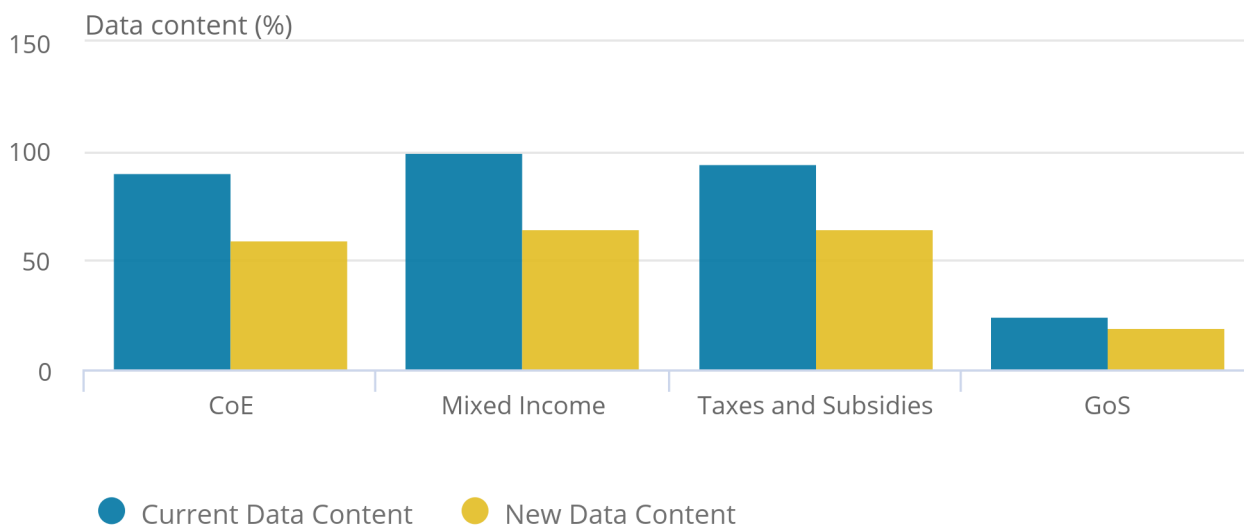
Forthcoming analysis will explain some of the steps that will be taken to reduce these impacts on data content. This will include updating the specification of the bias adjustment that is currently applied to the first estimate of construction, while there will also be improvements to how we handle late survey responses. It is expected that this will compensate for the lower data content, thereby reducing the scope for further revisions. It is also important to note that we will be reviewing our data processing timetables in line with the changes here.

## Impact on income

Overall, the income measure of GDP will see a slightly larger reduction in data content than the expenditure measure, reducing by around one third in the new first estimate compared with the current second estimate. This largely reflects the fact that, under the new model, we will lose one month's worth of Labour Market data on earnings and employment that feed into our estimates of the compensation of employees and mixed income (self-employed). The new first quarterly estimate will have two months of real data and a forecast third month, with real data for that final month being available for inclusion within the Quarterly National Accounts.

**Figure 4: Data content of income components of GDP**

Figure 4: Data content of income components of GDP



Source: Office for National Statistics

Figure 4 shows the impact on data content for compensation of employees, mixed income, taxes and subsidies, and gross operating surplus.

## 5 . Publication schedule of releases

Under the new model, monthly gross domestic product (GDP) will also be released around the 10th of each month as part of the Short-term economic indicators (STEI) theme day. For the second calendar month of each quarter the first quarterly estimate will be published alongside monthly GDP. The Quarterly National Accounts will continue to be published at the end of the final calendar month of the quarter. The timetable below contains the publication dates for these releases over the first six months of the publication model (see Table 2).

**Table 2 : Timetable of releases for the first six months of the publication model**

<b>Calendar month</b>	<b>Monthly releases</b>	<b>Quarterly releases</b>
July	Tuesday 10 <sup>th</sup> : Monthly GDP/ STEI (for May)	
August	Friday 10 <sup>th</sup> : Monthly GDP/STEI (for June)	Friday 10 <sup>th</sup> : First quarterly GDP estimate (for Quarter 2)
September	Monday 10 <sup>th</sup> : Monthly GDP/STEI (for July)	Friday 28 <sup>th</sup> : Quarterly National Accounts (for Quarter 2)
October	Wednesday 10 <sup>th</sup> : Monthly GDP /STEI (for August)	
November	Friday 9 <sup>th</sup> : Monthly GDP/STEI (for September)	Friday 9 <sup>th</sup> : First quarterly GDP estimate (for Quarter 3)
December	Monday 10 <sup>th</sup> : Monthly GDP/ STEI (for October)	Friday 21 <sup>st</sup> : Quarterly National Accounts (for Quarter 3)

Source: Office for National Statistics

## 6 . Products

The introduction of monthly estimates of gross domestic product (GDP) has provided us with the opportunity to create a new format for the accompanying statistical bulletin, which responds to the needs of all users of economic statistics. Monthly GDP will be presented in a short, chart-based bulletin, that will be approximately two pages of figures focused on only the main headlines, with minimal text alongside these figures. This change is to make our findings accessible to our users, particularly non-specialists, who will find this format easy to digest while still gaining an understanding of the economy's performance. The additional detail will still be available in the Index of Services, Index of Production, and Construction bulletins, so there will be no loss of information for users.

This visual format will also be used for the month of the quarter in which monthly GDP and the first quarterly estimate of GDP are released on the same day. However, it will be expanded slightly to include information on the extra income and expenditure data in this release. A technical article will be published on the same day providing more detail on the first quarterly estimate of GDP. This will be similar to the current bulletin for quarterly GDP releases, and will include economic commentary. Having these two releases ensures that the general user will continue to be able to access the latest information on the economy in an easy-to-use format, while specialist users will be able to refer to the technical bulletin for a more comprehensive explanation of the estimates.

The Quarterly National Accounts (QNA) bulletin will be in the same format as the current QNA statistical bulletin. This will provide details and economic commentary in a similar style to the technical article but with the much higher data content that is available at this point.

Alongside the QNA, ONS will be publishing a Quarterly Economic Commentary, which will cover all economic statistics including GDP.

ONS will be publishing a prototype of the new monthly GDP bulletin in the months leading up to the introduction of the new model, and seeking feedback on the new format.

## 7 . Revisions policy

With the new model, the revisions policy has also been updated. The basic principle is that monthly GDP publications will only revise previous months in the quarter that the data refers to (the reference period). Thus, the publication for month two will revise for month one, and the publication for month three will revise for months one and two. The first quarterly estimate will only revise data sources (monthly or quarterly) within the quarter to which it refers. For example, for the publication on Quarter 2 the only revisions will be from data sources related to the months April, May, and June. It should be noted that, in the month in which monthly GDP and the first estimate of quarterly GDP are published, their revisions period will also coincide. The revisions policy for Index of Services, Index of Production, and Index of Construction will mirror that of monthly GDP.

Additionally, there are three revision categories that take on revisions from a longer period of time; annual benchmarking, seasonal adjustment, and UK National Accounts: The Blue Book. All these categories occur on a yearly basis. Annual benchmarking takes on revisions from the beginning of the previous calendar year. In the case of seasonal adjustment, at the point in which the full year is formed for the first time the period is open for revision to allow for seasonal factor changes to be updated. Blue Book releases are open to revisions for the period back to 1997 (the earliest point for which data is available).

The timetable for revisions (segmented by calendar month) is as follows.

### Quarter 1 (Jan to Mar)

#### January

Monthly GDP (November) will revise for October. It will also take on revisions from the Annual Benchmarking process in the previous month.

#### February

Monthly GDP (December) will revise for the months within Quarter 4. As part of the quarterly round, seasonal adjustments revisions from the previous year (January to December) will also be taken on in these publications.

#### March

Monthly GDP (January) will not take on any revisions. QNA (Quarter 4) published at the end of the month will also take on seasonal adjustment for the previous year.

### Quarter 2 (Apr to Jun)

#### April

Monthly GDP (February) will take on revisions from January. It will also catch up on revisions from the seasonal adjustments taken on in March's QNA.

## **May**

Monthly GDP (March) will revise for the months within Quarter 1.

## **June**

Monthly GDP (April) will not take on any revisions. QNA (Quarter 1) published at the end of June will revise for the months within Quarter 1. In years with a June publication of the Blue Book round, this QNA will also take on Blue Book revisions. In years with a September Blue Book, we will take on the VAT data for Quarter 4 of the previous year, and open up for revisions back to the beginning of the previous calendar year to allow us to review our seasonal adjustment.

## **Quarter 3 (Jul to Sep)**

### **July**

Monthly GDP (May) will take on revisions from April. It will also catch up on any revisions taken on in the QNA published in June. This includes when the Blue Book round is in June, when this monthly publication will take on any Blue Book revisions.

### **August**

Monthly GDP (June) will revise for months within Quarter 2.

### **September**

Monthly GDP (July) will not take on any revisions. QNA (Quarter 2) published at the end of September will take on revisions from the beginning of the previous calendar year. In years with a September Blue Book round, this QNA will also take on Blue Book revisions.

## **Quarter 4 (Oct to Dec)**

### **October**

Monthly GDP (August) will take on revisions from July. It will also catch up on any revisions taken on in the QNA published in September. This includes when the Blue Book round is in September, when this monthly publication will take on any Blue Book revisions.

### **November**

Monthly GDP (September) will revise for months within Quarter 3.

# December

Monthly GDP (October) will not take on any revisions. QNA (Quarter 3) published at the end of December will revise for the months within Quarter 3. It will also take on revisions from the current and previous year as part of the annual benchmarking process.

Figure 5 provides an illustrative diagram of how the new revisions policy will operate.

**Figure 5: Illustrative timetable of revisions periods for 2019**

Reference Period	Date of Publication															
	10 <sup>th</sup> Jan	10 <sup>th</sup> Feb	10 <sup>th</sup> Mar	30 <sup>th</sup> Mar	10 <sup>th</sup> Apr	10 <sup>th</sup> May	10 <sup>th</sup> Jun	30 <sup>th</sup> Jun	10 <sup>th</sup> Jul	10 <sup>th</sup> Aug	10 <sup>th</sup> Sep	30 <sup>th</sup> Sep	10 <sup>th</sup> Oct	10 <sup>th</sup> Nov	10 <sup>th</sup> Dec	23 <sup>rd</sup> Dec
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May 18																
Jun 18																
Jul 18																
Aug 18																
Sep 18																
Oct 18	Monthly revision															
Nov 18	Nov GDP															
Dec 18		Dec/ Q4 GDP		Q4 QNA												
Jan 19			Jan GDP		Monthly revision	Quarterly revision		Quarterly revision								
Feb 19					Feb GDP											
Mar 19						Mar/ Q1 GDP		Q1 QNA								
Apr 19							Apr GDP									
May 19																
Jun 19																
Jul 19																
Aug 19																
Sep 19																
Oct 19																

## 8 . Information about giving feedback

If you have any questions or feedback about the new GDP publication model, please email James Scruton at [gdp@ons.gov.uk](mailto:gdp@ons.gov.uk) or call +44 (0)1633 456724.