

Article

# National Accounts articles: Impact on GDP current price and chained volume measure annual and quarterly estimates: 1997 to 2015

Estimates of the total impact of all the improvements to current price and chained volume measure gross domestic product (GDP) from 1997 to 2015, planned for publication in September 2017.



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# 1 . Authors

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## 2 . Executive summary

This article details estimates of the total impact of all the improvements to current price (or nominal) and chained volume measure (CVM or real) gross domestic product (GDP) up to 2015, in the Blue Book 2017-consistent Quarterly National Accounts (QNA) due for publication on 29 September 2017.

Indicative impacts of improvements for the period 1997 to 2012 have already been announced in the article [Impact of Blue Book 2017 changes on chained volume measure gross domestic product estimates, 1997 to 2012](#), published on 13 March 2017. This article focuses on the period from 2013 to 2015 and brings together both current price and CVM revisions along with the quarterly path. There are also some minor changes to the figures previously announced for 1997 to 2012 following further quality assurance.

All of the methodological improvements for the period 2013 to 2015 have already been described in articles covering the period 1997 to 2012 (see [National Accounts articles](#) for related articles), but this later period also includes the impact of routine take on of new data.

The total package of current price GDP changes increases the size of the economy in 2015 by approximately £16.0 billion, which is 0.9% of GDP.

There are upward revisions to real GDP growth for the years 2013 and 2015, of 0.2 and 0.1 percentage points respectively. Real GDP growth in 2014 is unrevised. Average growth of real GDP over the period from 1998 to 2015 remains unchanged at 2.0% per year.

Quarter-on-quarter real GDP growth between 2013 and 2015 has been revised up by 0.03 percentage points per quarter on average. However, over the whole period from Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2015, there is no revision to two decimal places to the average growth per quarter. Over the same period the average absolute revision to quarter-on-quarter real GDP growth is 0.05 percentage points.

The peak to trough of the 2008 to 2009 economic downturn has been revised from negative 6.3% to negative 6.1% and GDP returned to pre-economic downturn levels in Quarter 2 2013, which was 1 quarter earlier than previously estimated.

## 3 . Introduction

This article is part of a series describing [changes to National Accounts](#), detailing the improvements that will be made in September 2017 to ensure that the UK National Accounts continue to provide the best possible framework for analysing the UK economy and for comparing it with those of other countries.

The article published on 16 February 2017, [National Accounts articles - Impact of Blue Book 2017 changes on current price gross domestic product estimates, 1997 to 2012](#), described improvements being made to the UK National Accounts in current price terms. This article detailed methodological changes such as:

- improvements to actual and imputed rental estimates
- [gross fixed capital formation \(GFCF\) survey improvements](#)
- GFCF transfer costs
- [separating estimates for the household and non-profit institutions serving households sectors](#)
- unfunded public sector pensions
- improvements to illegal activities
- estimates of Value Added Tax fraud
- BBC data update
- public sector finances alignment

These changes are being made as part of the regular annual update of the UK National Accounts (Blue Book). Current price revisions will have a similar impact feeding through to affect real gross domestic product (GDP).

A second impact article, [National Accounts articles: Impact of Blue Book 2017 changes on chained volume measure gross domestic product estimates, 1997 to 2012](#), provided a summary of the changes being implemented in Blue Book 2017 that impact on real GDP between 1997 and 2012.

This article extends the data series from both previous articles to provide current price and chained volume measure (CVM) estimates, consistent with the methodological changes previously described, for all periods from 1997 to 2015. Descriptions of these methodological changes and other improvements will not be repeated in this article, but more information can be found in the [National Accounts articles](#).

The total impacts on GDP of the current price changes are included in [Annex A: Detailed table](#) and [Annex B: Summary table](#), but explanations of the changes to 1997 to 2012 will not be repeated in this article as these data have not been revised since the 16 February 2017 article. Approximate impacts on annual current price GDP growth rates by type of change for the years 2013 to 2015 are provided in section 5.

Full details of the annual contributions to real GDP by each CVM expenditure component (shown to the nearest 0.1 percentage point) are available in [Annex C](#). For the period 1998 to 2012, there have been some minor changes to the CVM estimates previously published on 13 March 2017.

Quarterly current price and real GDP growth rates (see [Annex D and Annex E](#) respectively) are also being extended to include 2013 to 2015 in this article and this will enable you to see the impacts that the annual revisions have had on the quarterly path of GDP during this period. The publication of both current price and real GDP allows for the calculation of the GDP implied deflator. The annual implied deflator is shown in [Annex F](#) and the quarterly implied deflator in [Annex G](#) for completeness. These implied deflator tables also show some minor changes to the figures provided on 13 March 2017 following further quality assurance, but the changes are small and do not change the economic story being presented.

It is possible that the quarterly path presented in this article will change slightly when the UK National Accounts are published on 29 September 2017, as the addition of the annual level for 2016 and the resultant quarterly path in 2016 can alter the quarterly path of earlier years through re-seasonal adjustment.

All CVM figures have also been adjusted as a result of the change of reference year and last base year from 2013 to 2015. This article therefore focuses on the revisions to growth that will not be affected by rebasing, rather than describing changes to the levels of real GDP that will change when the reference year is advanced by 2 years.

Gross national income (GNI) estimates for 1997 to 2012 were published on 19 April 2017 in the article [National Accounts articles: Impact of Blue Book 2017 changes on the sector and financial accounts, 1997 to 2012](#) published on 19 April 2017. Estimates for 2013 to 2015 will be published on 21 August 2017 in National Accounts articles: Detailed assessment of changes to sector and financial accounts, 1997 to 2015.

## 4 . Summary of changes

The latest estimates of the impact of the planned changes on gross domestic product (GDP) are shown in Table 1.

**Table 1: Latest estimates of the impact of the planned changes on annual GDP, UK**

Indicator	Impact
Level of GDP in current prices	See Annex A
Near-final estimate of the impact of all changes to the level of annual GDP in current prices	Average revision to the level of GDP 1997 to 2015 is +0.6% (£8.7 billion)
Growth of GDP in current prices	See Annex A and Annex B
Near-final estimate of the impact of all changes to the growth of annual GDP in current prices	Average revision to GDP growth in current prices 1998 to 2015 is -0.02 percentage points (ranging from -0.3 to +0.2 percentage points)
Real measure of GDP	See Annex C
Near-final estimate of the impact on growth in annual real GDP (chained volume measure)	Average revision to real GDP annual growth 1998 to 2015 is -0.01 percentage points (ranging from -0.2 to +0.2 percentage points)
GDP implied deflator	See Annex F
Near-final estimate of the impact on growth in annual GDP deflator	Average revision to annual growth of the GDP deflator 1998 to 2015 is +0.02 percentage points (ranging from -0.1 to 0.1 percentage points)

Source: Office for National Statistics

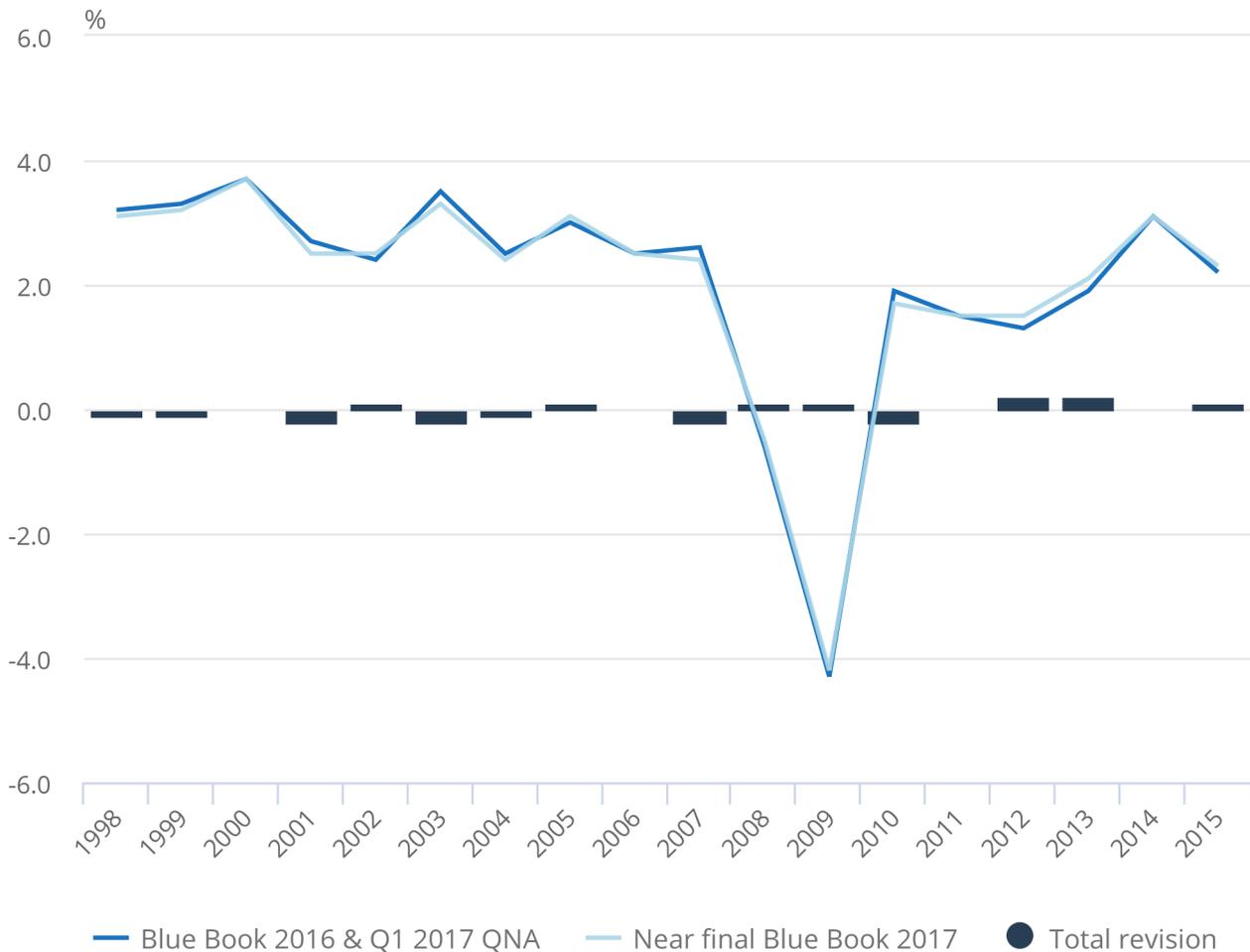
This year the changes in current price GDP growth rates have a similar impact on the real GDP growth rates. Revisions to the growth rate of annual real GDP range from negative 0.2 percentage points to positive 0.2 percentage points (see Figure 1 and [Annex C](#) for more details).

**Figure 1: Impact of Blue Book 2017 changes on annual growth rates of real GDP (chained volume measure)**

UK, 1998 to 2015

Figure 1: Impact of Blue Book 2017 changes on annual growth rates of real GDP (chained volume measure)

UK, 1998 to 2015



Source: Office for National Statistics

Source: Office for National Statistics

## Annual current price GDP

The package of GDP changes in Blue Book 2017, over the period from 1998 to 2015, reduces the average annual growth in current price GDP by 0.02 percentage points. Current price average GDP growth remains at 3.9% per year (at one decimal place) in Blue Book 2017.

## Annual real GDP

The package of real GDP changes being presented in this article, over the period 1998 to 2015, have the combined impact of very slightly reducing the average growth of real GDP, by around 0.01 percentage points, but to one decimal place the average growth remains at 2.0% per year in Blue Book 2017, the same as in Blue Book 2016.

However, the changes do impact on real GDP growth rates by varying amounts between years (see [Annex C](#) for more details). Revisions to the growth rate of annual real GDP range from negative 0.2 percentage points to positive 0.2 percentage points. The main reasons for the revisions in 1997 to 2012 were described in the article, [National Accounts articles: Impact of Blue Book 2017 changes on chained volume measure gross domestic product estimates, 1997 to 2012](#), published on 13 March 2017. Section 5 in this article continues this analysis for the period 2013 to 2015.

In general, the main reasons for revisions to real GDP in 2013 to 2015 are the same as the revisions described in section 5 for current price GDP.

## Quarterly GDP

As a result of changes to the level of annual GDP, the GDP quarterly path also needs adjusting to achieve the new annual levels. The quarterly path revisions to current price GDP are shown in [Annex D](#) and the real GDP quarterly path revisions are in [Annex E](#).

The average revision to quarter-on-quarter real GDP growth introduced at Blue Book 2017 is unchanged to two decimal points over the period from Quarter 2 (Apr to June) 1997 to Quarter 4 (Oct to Dec) 2015. Over the same period the absolute revision to quarter-on-quarter real GDP growth is 0.05 percentage points. The peak to trough of the 2008 to 2009 economic downturn has been provisionally revised from negative 6.3% to negative 6.1%. GDP returned to pre-economic downturn levels in Quarter 2 2013, which was 1 quarter earlier than previously estimated.

For the period 1997 to 2015, quarterly GDP revisions reflect new annual data and improved methods along with a reassessment of the seasonal adjustment of each component within GDP; with the seasonal adjustment changes being much smaller in impact than the annual changes. The quarterly path presented in [Annex E](#) is provisional at this stage and is subject to further change when annual GDP for 2016 is added to the time series.

## 5 . Contributors to the revisions in current price and real GDP, 2013 to 2015

All methods improvements and other changes referred to in this section have previously been described in the articles:

- [National Accounts articles - Impact of Blue Book 2017 changes on current price gross domestic product estimates, 1997 to 2012](#), published on 16 February 2017
- [National Accounts articles - Impact of Blue Book 2017 changes on chained volume measure gross domestic product estimates, 1997 to 2012](#), published on 13 March 2017

The method of calculating contributions to growth for chained volume measures (CVM) data in Blue Book 2016 relied on the additivity of the series, meaning we were only able to produce a very short time series for contributions. With the reference year moving on 2 years to 2015 in Blue Book 2017, we are going to have fewer periods of additive CVM data, increasing the need for an alternative contributions method. Further details can be found in [Annex H][3].

## 2013

In 2013, annual current price GDP growth has been revised up by 0.1 percentage points from 3.9% to 4.0%.

The change to the measurement of actual rental was the only change to impact current price GDP growth by more than 0.1 percentage points.

In 2013, annual real GDP growth has been revised up by 0.2 percentage points from 1.9% to 2.1%.

## 2014

In 2014, annual current price GDP growth was unrevised at 4.8%. An upwards revision of 0.1 percentage points due to actual rental was offset by a number of small downward revisions.

In 2014, annual real GDP growth is unrevised at 3.1%.

## 2015

In 2015, annual current price GDP growth was unrevised at 2.8%. The main contributions to the revisions to growth are shown in Table 2.

**Table 2: Contributions to 2015 annual current price UK GDP revisions to growth**

<b>Revision</b>	<b>Percentage point impact on current price GDP growth</b>
Actual Rental	0.16
GFCF Survey Improvements	0.06
Inclusion of updated data	-0.16
Others	-0.01
<b>Total revision</b>	<b>0.05</b>

Source: Office for National Statistics

The methodological change to actual rental is showing stronger growth into 2015 than the old methodologies and data sources. The survey improvements relating to gross fixed capital formation (GFCF) were a bigger drag on the current price levels in 2014 than 2015, causing an increase in growth into 2015.

However, these upward revisions are partially offset by a negative contribution to growth from the inclusion of updated internal and external data sources. In particular, there are downward revisions in exports of services, mainly due to the take on of new insurance source data and to final consumption expenditure data for non-profit institutions serving households, due to updated source data.

Annual data sources updated for 2015 include:

- Annual Business Survey (ABS) data
- Her Majesty's Revenue and Customs (HMRC) data for compensation of employees and gross operating surplus (2014 to 2015 financial year)
- Manufacturers' Sales by Product (PRODCOM) survey data
- International Trade in Services (IT IS) survey data
- Department for Environment, Food and Rural Affairs (Defra) agriculture data
- Department for Communities and Local Government (DCLG) pensions data.

In 2015, annual real GDP growth has been revised up by 0.1 percentage points from 2.2% to 2.3%.

## 6 . Plans for future updates

This article is the fourth in a series of impact articles ahead of the Quarterly National Accounts consistent with Blue Book 2017 publication on 29 September 2017. The focus here is on the years 1997 to 2015 for current price and real gross domestic product (GDP) changes and the quarterly path of GDP for the same periods.

Table 3 gives a schedule for the remaining articles leading up to the publication of Blue Book 2017 on 31 October 2017.

**Table 3: Publication schedule for Blue Book 2017 and Pink Book 2017, UK**

<b>Content of Article</b>	<b>Date of publication</b>
Detailed assessment of changes to sector and financial accounts 1997-2015	Monday 21 August 2017
Detailed assessment of changes to Balance of payment annual estimates 1997-2015	Monday 21 August 2017
Quarterly National Accounts Quarter 2 (Apr to June) 2017 (consistent with Blue Book 2017)	Friday 29 September 2017
Balance of Payments Quarter 2 (Apr to June) 2017 (consistent with Pink Book 2017)	Friday 29 September 2017
UK quarterly sector accounts: Apr to June 2017 (consistent with Blue Book 2017)	Friday 29 September 2017
Impact of method changes to the National Accounts and Sector Accounts: Jan to Mar 1997 to Apr to June 2017	Friday 29 September 2017
Blue Book 2017	Tuesday 31 October 2017
Pink Book 2017	Tuesday 31 October 2017

Source: Office for National Statistics

## Annex H: Contributions to growth for chained volume measure (CVM) data

### Introduction

The method of calculating contributions to growth for chained volume measure (CVM) data in Blue Book 2016 relied on the additivity of the series, meaning we were only able to produce a very short time series for contributions. With the reference year moving on 2 years to 2015 in Blue Book 2017, we are going to have fewer periods of additive CVM data, increasing the need for an alternative contributions method.

### Blue Book 2016 method for calculating contributions to growth

In national accounts publications, we produced the contributions to growth for CVM data from the reference year onwards, given the data are additive for these periods.

The formula for the quarter-on-quarter contribution of component C to GDP growth at time t was as follows:

$$\frac{(C, volume_t - C, volume_{t-1})}{GDP, volume_{t-1}}$$

### Blue Book 2017 additive volume data (AVD) method

In line with Eurostat's recommendations and international best practice we have adopted the additive volume data (AVD) method for calculating contributions to growth. This will be implemented in the Blue Book 2017-consistent Quarterly National Accounts (QNA) publication on the 29th September 2017.

The AVD method uses the current Blue Book 2016 method, to which an additional term is applied to transform the chain-linked volume estimates to obtain estimates in the prices of the previous year.

The formula for the quarter-on-quarter contribution of component C to GDP volume growth is as follows:

$$\frac{(C, volume_t - C, volume_{t-1})}{GDP, volume_{t-1}} * \frac{C, deflator_{A-1}}{GDP, deflator_{A-1}}$$

The terms in this equation have the following meaning:

- deflator equals annual deflator derived from CP / CVM
- t equals quarter t
- A equals year A

Note that this formula needs to be adapted for annual and quarter-on-same quarter of the previous year contributions to growth.

This method should not be applied directly to those QNA variables that can take positive and negative values, such as changes in inventories and a statistical discrepancy. The contributions to growth of such variables can be derived residually by taking advantage of the fact that contributions to growth are additive using this method.

Implementing the AVD method will not only enable us to continue publishing contributions to growth but it will also enable us to extend the contributions analysis to cover all years.

