

Article

National Accounts articles: Impact of Blue Book 2015 Changes on Chained Volume Measure Gross Domestic Product Estimates, 1997 to 2010

This article details estimates of the total impact of all the improvements to chained volume measure (CVM or "real") gross domestic product (GDP) planned for September 2015.

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1. Executive summary

This article details estimates of the total impact of all the improvements to chained volume measure (CVM or "real") gross domestic product (GDP) planned for September 2015.

All of the current price impacting improvements have already been announced in the article [Impact of Blue Book 2015 Changes on Current Price Gross Domestic Product, 1997 to 2010](#), published on 12 June 2015. This article brings together these current price changes along with other improvements which impact only on real GDP, and also presents a first look at the quarterly path of GDP in Blue Book 2015 for 1997 to 2010. The improvements described in this article will also be applicable to subsequent years, but these later years are additionally subject to regular data updates and other methodological developments, which will be presented in future articles as detailed in Table 2.

The package of real GDP changes as a whole, over the period 1998 to 2010, have the combined impact of reducing the average growth of real GDP by around 0.2 percentage points from 2.2% per annum in Blue Book 2014, to 2.0% per annum in Blue Book 2015.

The average revision to quarter on quarter real GDP growth introduced at this Blue Book is -0.03 percentage points over the period from Quarter 2 (April to June) 1997 to Quarter 4 (October to December) 2010. Over the same period the absolute revision to quarter on quarter real GDP growth is 0.10 percentage points. The peak to trough of the 2008/09 economic downturn has been revised from -6.0% to -6.1%.

2. Introduction

This article is part of a series describing [changes to national accounts](#), detailing the improvements which will be made in September 2015 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 previous article of 12 June 2015, [Impact of Blue Book 2015 Changes on Current Price Gross Domestic Product, 1997 to 2010](#) described improvements being made to the UK national accounts in current price terms. This article included those changes being implemented to address the remaining outstanding gross national income (GNI) reservations on a European System of Accounts 1995 (ESA 1995) basis, and those being made as part of the regular annual update of the UK National Accounts (Blue Book). The full dataset will be published as part of the Quarter 2 (April to June) 2015 Quarterly National Accounts update.

Current price revisions will, in most cases, feed through to impact on real GDP as well, although there are a few exceptions. This article provides a summary of the changes being implemented in Blue Book 2015 which impact on real GDP between 1997 and 2010, and provides an estimate of the impact on the expenditure components of GDP for the main changes. The total impacts on GDP of the ESA 1995 GNI reservations and ESA 2010 current price changes are also included in the Annex A detailed table and Annex B summary table, but descriptions of these changes will not be repeated here.

For each expenditure component, the range of approximate impacts on annual real GDP growth rates across the years from 1998 to 2010 is provided in the summary along with an explanation of the impact of the change, with the full detail for each expenditure component shown to the nearest 0.1 percentage point in Annex C.

Quarterly current price and real GDP growth rates (see Annexes D and E) are also being published in this article earlier than planned and this will enable users to see the impacts that the annual revisions have on the quarterly path of GDP and on the economic downturn of 2008/09. 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 figures are still indicative at this stage and final quality assurance is currently being undertaken. A finalised version of these data will be provided in an updated article during August 2015 ahead of publication in the UK national accounts in September 2015. It is also possible that the quarterly path presented in this article will change slightly when the UK national accounts are published as the addition of annual levels and the quarterly path for more recent years can alter the quarterly path of earlier years through re-seasonal adjustment.

Figures for 2011 and more recent years are not yet available. These will not be processed until closer to the time of publication in order to take account of the most recent available data in the usual manner. All figures will also be adjusted as a result of the change of reference year and last base year from 2011 to 2012. This article therefore focuses on the revisions to growth which will not be affected by rebasing, rather than describing changes to the levels of real GDP which will change when the reference year is advanced by 1 year. Plans are to publish both current price and chained volume measure (CVM) data for 2011 to 2013 on 5 August 2015 as set out in Table 2.

On 17 July we also published an article on [Changes to National Accounts: Gross Fixed Capital Formation – changes to Blue Book 2015 \(1997 to 2010\)](#) (357.1 Kb Pdf)

3. Summary

The latest estimates of the impact of the planned changes on GDP are shown in Table 1.

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

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 level of GDP 1997 to 2010 is +0.3% (£2.7 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 2010 is -0.06 percentage points (ranging from -0.4 to +0.3 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 annual growth 1998 to 2010 is -0.11 percentage points (ranging from -1.0 to +0.2 percentage points)
GDP IMPLIED DEFLATOR	See Annex D
Near-final estimate of the impact on growth in annual deflator	Average revision to annual growth 1998 to 2010 is +0.05 percentage points (ranging from -0.2 to +0.5 percentage points)

The package of real GDP changes being presented in this article, over the period 1998 to 2010, have the combined impact of reducing the average growth of real GDP by around 0.2 percentage points from 2.2% per annum in Blue Book 2014, to 2.0% per annum in Blue Book 2015.

However, the changes do impact on the 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 -1.0 percentage points in 2003 to +0.2 percentage points in 2005 and 2007. The main drivers of these revisions for each component are summarised in Section 3. Work continues to decompose the overall revisions for each expenditure component into the exact contributions by revision type, and this will be published in the article accompanying the 30 September Quarterly National Accounts release. Generally though, the main reasons for revision to real GDP are the same as the revisions already described for current price GDP. These include ESA 1995 GNI reservations for non-profit institutions serving households (NPISH) and exhaustiveness, and other revisions due to the correction to the measurement of the insurance industry and classifications, but there are also changes which only impact on real GDP such as the non-monetary gold improvement and the improvements to the deflator used in the calculation of software investment.

As a result of changes to the level of annual real GDP, the quarterly path of real GDP 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 this Blue Book is -0.03 percentage points over the period from Quarter 2 (April to June) 1997 to Quarter 4 (October to December) 2010. Over the same period the absolute revision to quarter on quarter real GDP growth is 0.10 percentage points. The peak to trough of the 2008/09 economic downturn has been revised from -6.0% to -6.1%. Until GDP for later years have been compiled, it is not possible to say what this does for the shape and strength of the subsequent recovery period post 2010.

For the period 1997 to 2010, quarterly GDP revisions are driven by changes to annual data and methodologies 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.

4. Methodological improvements to real GDP by component

Unless otherwise specified, [all changes referred to in this section have previously been described in the articles of 19 May and 12 June 2015.](#)

Household final consumption expenditure (HHFCE)

HHFCE contributes between -0.3 percentage points to the overall real GDP revision in 2010 to +0.2 percentage points in 2007. Generally the household revisions are small in size but are for a number of different reasons, and so the overall impact varies from year to year.

HHFCE is impacted by the GNI reservations on NPISH, cross border property income, exhaustiveness and narcotics. Other changes impacting on real HHFCE are from adjustments to smuggling, alcohol and tobacco data updates and the correction to the measurement of the insurance industry estimates.

NPISH final consumption expenditure

NPISH real final consumption expenditure revisions are very small in value terms and have no impact on the real GDP annual growth rates to 1 decimal place. There are no current price revisions to NPISH final consumption expenditure on an annual basis and the small real revisions are due to slight revisions to the deflators used in this sector.

Government final consumption expenditure (GGFCE)

GGFCE revisions are also small in size and have a maximum impact on real annual GDP of between -0.1 percentage points in 1999, 2002 and 2003, and +0.1 percentage points in 2004. The main impact on real GGFCE annual growth is from the Local Government Pension change and the resulting improvements to the compensation of employees' estimates, with other smaller impacts from the reclassifications of Network Rail and Transport for London. GNI reservations for consumption of fixed capital on roads, and vehicle registration tax also impact on GGFCE levels but have no impact on real GDP growth rates to 1 decimal place.

Gross capital formation (GCF)

GCF is made up of the constituent parts of Gross Fixed Capital Formation (GFCF), changes in inventories and changes in valuables and these 3 elements are then "chain-linked" together to produce the real GCF totals.

The total impact of GCF revisions on real annual GDP is a contribution of between -0.6 percentage points in 2003 to +0.5 percentage points in 2009.

There are no revisions this year to changes in inventories on an annual basis due to new methods or data.

A full description of the revisions to GFCF is provided in the article [Changes to National Accounts: Gross Fixed Capital Formation – changes to Blue Book 2015 \(1997 to 2010\)](#) (357.1 Kb Pdf) published on 17 July 2015. Within these revisions, those impacting on real GDP growth will include the GNI reservations on repairs and maintenance of dwellings and exhaustiveness (both the under-coverage adjustment and the concealed income adjustment) as well as other changes to the measurement of Government GFCF and the reclassification of Transport for London. Additionally there is a [Change to the deflation of investment in software](#) (522.5 Kb Word document) as detailed in an article on 26 March 2015 which will only impact on real estimates of GFCF.

Acquisitions less disposals of valuables revisions are due to an adjustment for non-monetary gold. Although this adjustment has no impact on current price GDP as it is a switch between valuables and trade components and is GDP neutral, it will have an impact on the estimates of real GDP due to different weighting of deflators in the 2 areas. Further information on the non-monetary gold change will be provided in an article on 17 September 2015.

Chain-linking requires updating the base year every year, meaning that, in practice, every series to be presented in real terms is estimated both in current prices and prices of the previous year (PYPs). The growth rates of the series in successive years on the same prices (for example, 2006 estimated in current prices and 2007 in PYPs) are linked together in a chain of short series (known as chain-linking) to give a full real terms time series.

In practice, chain-linking should ideally occur on positive level estimates, so as to remove the impact of negative data within the process of chain-linking. Previous changes to GCF, as detailed in the [Inventories – impact analysis of changes for Blue Book 2014](#) (259.1 Kb Pdf) article published on 30 September 2014, introduced the best practice of chain-linking on the level of inventories, with the change in inventories then being derived from the level estimates.

Quality assurance of all of the output datasets, including the resulting consistent PYP datasets, is a standard approach within our national accounts. Within GCF outputs, the quality assurance approach requires close assessment of the component parts: change in inventories, GFCF, and changes in valuables. During Blue Book 2014, some revisions were introduced to the GCF aggregate in 2003 due to the change in valuables variable, where the chain-linking outputs had changed sign from negative to positive between years. Data revisions to both the current price and real value of changes in valuables have removed this revision in Blue Book 2015 without the need to intervene. However, quality adjustments have been made in Blue Book 2015 to some of the PYPs within GCF, specifically for changes in valuables in several years and changes in inventories in 2009 to reduce the impact of unusually large PYPs. Future work for Blue Book 2016 will continue on reviewing the PYP outputs for these components.

Trade in goods and services

The overall impact of revisions to exports and imports of goods and services as a contribution to real GDP ranges from -0.4 percentage points in 2009 to +0.3 percentage points in 2004.

Trade have impacts from GNI reservations on NPISH, cross border property income and exhaustiveness. Additionally changes relating to non-monetary gold, smuggling of alcohol and tobacco and the correction to the measurement of the insurance industry also impact on the imports and/or exports of goods and/or services.

5. Plans for future updates

This article is the third in a series of impact articles ahead of the Quarterly National Accounts consistent with Blue Book 2015 publication on 30 September 2015. The focus here is on the years 1997 to 2010 for real GDP changes and the quarterly path of GDP for the same periods. The improvements described in this article will often also be applicable to subsequent years, but these years are additionally subject to regular data updates and other methodological changes which will be presented in future articles.

As well as the first impact article for Blue Book 2015, 4 detailed methodological articles were also published on 19 May 2015. The second impact article was published on 12 June. Links to all these articles can be found in Section 7. Table 2 gives a draft schedule for the remaining articles leading up to the publication of Blue Book 2015 on 30 October 2015. These dates are provisional. Final dates will be announced at least 1 month before each publication. The outline for the full publication timetable is as follows.

Table 2 - Provisional publication schedule for Blue Book and Pink Book 2015

Content of Article	Provisional date of publication
Impact on GDP Current Price and Chained Volume Measure quarterly and annual estimates 1997-2013	Wednesday 5 August 2015
Detailed assessment of changes to Sector and Financial Accounts 1997-2013	Friday 11 September 2015
Detailed assessment of changes to Balance of Payments 1997-2013	Friday 11 September 2015
Methodological Improvements to Non-monetary gold for Pink Book 2015	Friday 11 September 2015
Classification Changes to National Accounts for Blue Book 2015	Friday 11 September 2015
Methodological changes to the estimation of Capital Stocks and Consumption of Fixed Capital	Friday 11 September 2015
Quarterly National Accounts Q2 2015 (consistent with Blue Book 2015)	Wednesday 30 September 2015
Balance of Payments Q2 2015 (consistent with Pink Book 2015)	Wednesday 30 September 2015
Impact of changes in the national accounts and economic commentary for 2015 Quarter 2 (Apr to June)	Wednesday 30 September 2015
GDP(Output) improvement project report	Wednesday 30 September 2015
Blue Book 2015	Friday 30 October 2015
Pink Book 2015	Friday 30 October 2015

6. Background notes

1. References

[Blue Book and Pink Book 2015 changes.](#)

2. A list of those given pre-publication access to the contents of this article is published as part of this release.
3. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk