

Article

National Accounts articles: Changes to National Accounts Blue Book 2016: Improvements to household expenditure estimates

This is a technical article to explain the developments affecting the household final consumption expenditure (HHFCE) estimates for 1997 to 2014 released in the Blue Book 2016 dataset.

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Release date:
30 June 2016

Next release:
To be announced

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1. Introduction

This article explains developments and improvements to methodology affecting household final consumption expenditure (HHFCE) estimates for the period 1997 to 2014 released in the Blue Book 2016 dataset. The impact these have on HHFCE estimates for Quarter 1 (January to March) 2015 onwards are shown in the Quarter 1 2016 Consumer Trends release that is also published on 30 June 2016.

Developments include:

- improvements to the methodology for calculating estimates of imputed rentals for housing
- reduction to the assumed number of weeks worked per year by prostitutes
- incorporation of VAT fraud estimates into the HHFCE data – building on Blue Book 2015 developments relating to hidden activity (Ellis, 2015)

This article also highlights further developments to HHFCE estimates planned for implementation in future Blue Book publications.

2. Blue Book 2016: HHFCE revisions in current price terms

Revisions to levels

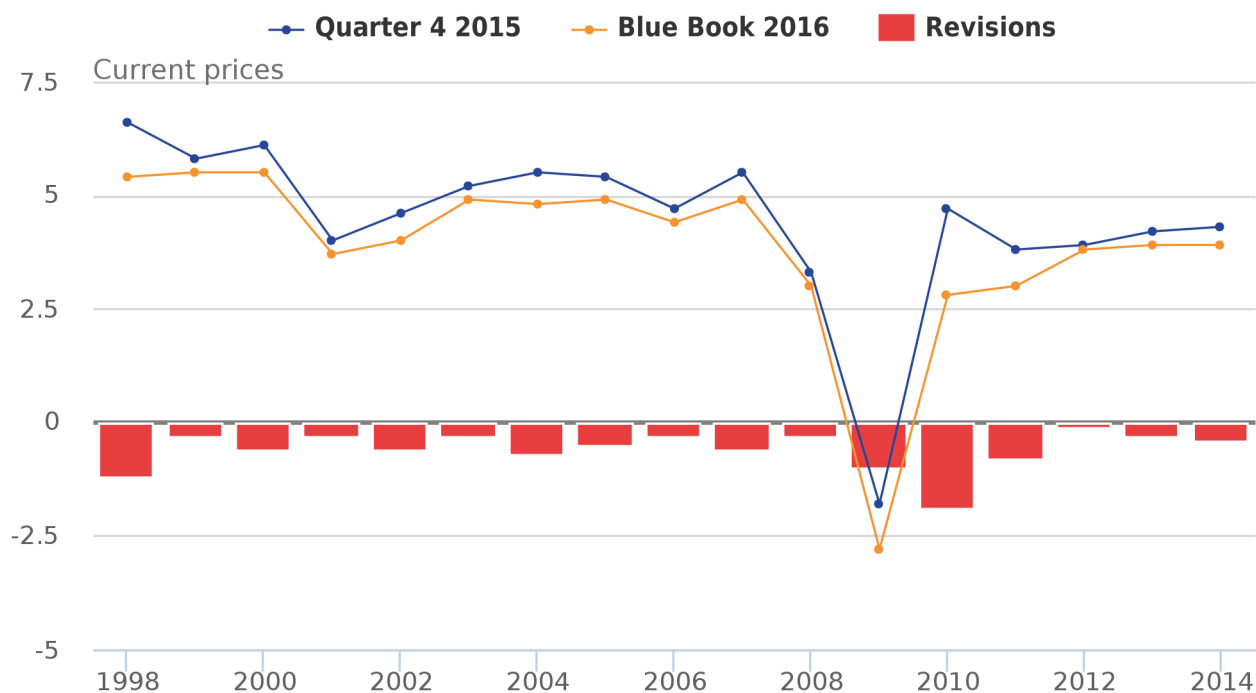
There are upward revisions to the current price annual levels for all years between 1997 and 2014. Upward revisions to the levels average 5.9%. The largest upward revision of 10.7% occurs in 1997 and the lowest of 0.6% in 2014. The upward revisions are mainly driven by improvements to the estimation methods for imputed rentals for housing.

Revisions to growths

There are downward revisions to the current price annual growth rates for all years over the same period. Revisions to growth rates average -0.6 percentage points and range between -0.1 (in 2012) and -1.2 percentage points (in 1998).

Figure 1: Annual household final consumption expenditure growth rates, comparison of Blue Book 2016 and previous estimates

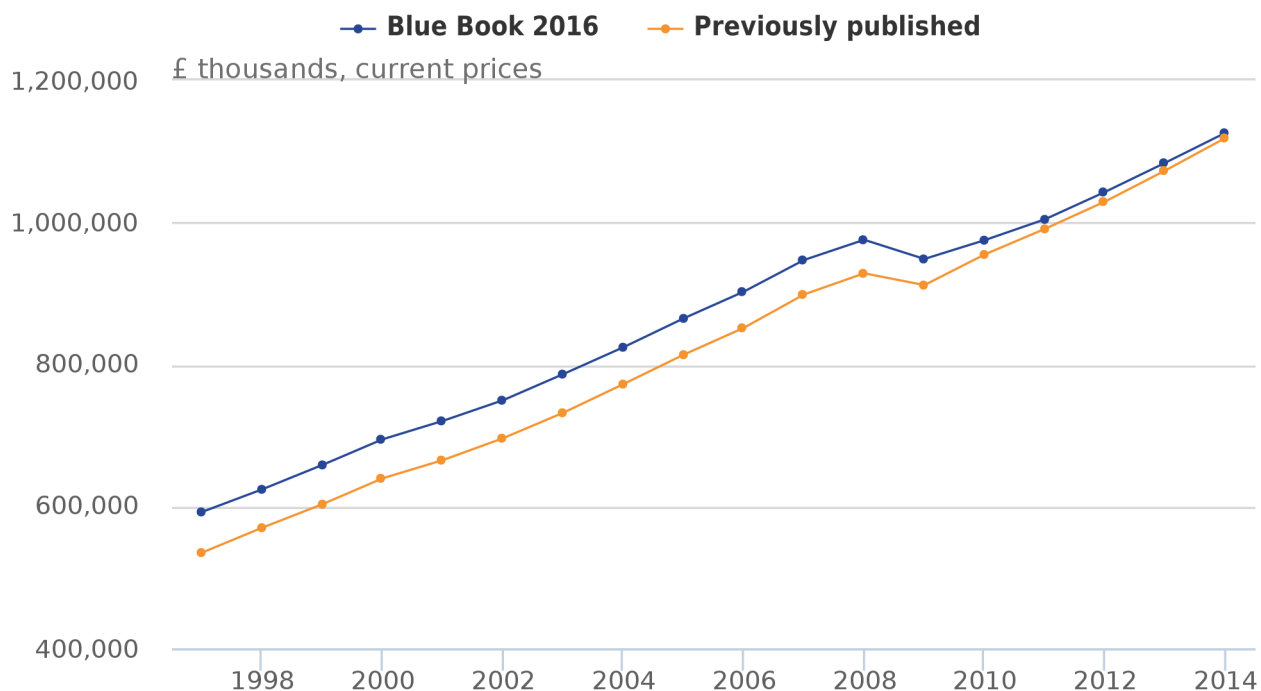
UK, 1998 to 2014



Source: Office for National Statistics

Figure 2: Total annual household final consumption expenditure, comparison between Blue Book 2016 and previously published

UK, 1997 to 2014



Source: Office for National Statistics

Revisions to current price annual growths between 1998 and 2011 are mainly driven by the new methodology for the estimation of imputed rentals. Revisions to growth in 2012 and 2013 are mainly due to the reassessment of existing Supply and Use balancing adjustments, which is included in column g in Table 1. Revisions to 2014 are mainly due to a combination of later source data and estimates going through Supply and Use balancing for the first time. These impacts are also included in column g in Table 1.

Table 1: Total annual household final consumption expenditure, revision between Blue Book 2016 and previous estimates

UK, 1997 to 2014

Year	Total revisions to HHFCE levels		Contribution to total revisions:				
			Imputed rental	Concealed income adjustment	VAT fraud	Prostitutes working weeks	Other (incl later data)
	£ million	%	£ million	£ million	£ million	£ million	£ million
	a	b	c	d	e	f	g
1997	57,277	10.7	57,053	24	808	-608	0
1998	54,055	9.5	53,916	18	761	-641	1
1999	55,350	9.2	55,195	21	809	-676	1
2000	54,996	8.6	54,873	19	832	-728	0
2001	55,276	8.3	55,168	23	870	-785	0
2002	53,513	7.7	53,521	18	813	-840	1
2003	54,451	7.4	54,503	27	814	-894	1
2004	51,929	6.7	51,979	33	869	-952	0
2005	51,167	6.3	51,213	31	927	-1,005	1
2006	51,003	6.0	51,041	32	970	-1,060	20
2007	48,576	5.4	48,617	27	1,055	-1,126	3
2008	47,243	5.1	47,312	32	1,058	-1,186	27
2009	36,816	4.0	37,093	80	936	-1,221	-72
2010	20,157	2.1	20,485	-228	1,135	-1,256	21
2011	13,448	1.4	14,441	-900	1,197	-1,294	4
2012	13,536	1.3	15,548	-1,129	1,150	-1,323	-710
2013	10,905	1.0	15,821	-1,475	1,137	-1,357	-3,221
2014	7,238	0.6	17,976	-1,475	1,186	-1,368	-9,081

Source: Office for National Statistics

3. Blue Book 2016: HHFCE revisions, chained volume measures

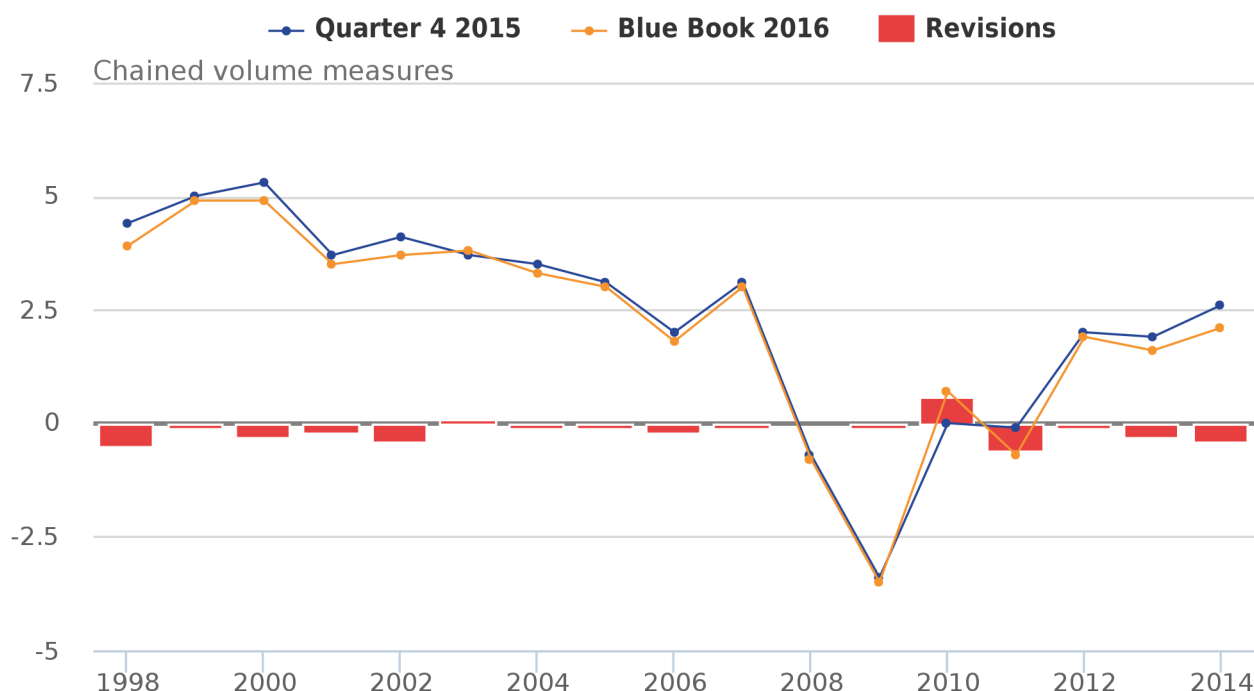
In Blue Book 2016, the reference year and last base year for the chained volume measures have been updated from 2012 to 2013. As with the current price estimates, revisions to growth in chained volume measures between 1998 and 2011 are predominantly driven by the improvements to imputed rentals. Revisions to chained volume measures growth between 2012 and 2014 are mainly due to a combination of Supply and Use balancing and updates to source data.

Revisions to the imputed rentals' chained volume measures are generally smaller than the revisions to the corresponding current price series as the source of volume data has not changed. Changes to the price data have a larger impact on current price imputed rentals estimates than on the chained volume measures. Other Blue Book 2016 revisions to chained volume measures are driven by the revisions to the current price data.

Revisions to the annual rates of growth in chained volume measures for total HHFCE are shown in Figure 3. Between 1998 and 2014, revisions average -0.2 percentage points and range between -0.6 in 2011 and +0.6 in 2010.

Figure 3: Annual household final consumption expenditure growth rates, comparison of Blue Book 2016 and previous estimates

UK, 1998 to 2014



Source: Office for National Statistics

4. Improvements to sources and methods: further details

This section gives further details of individual developments for the Blue Book 2016 data.

Imputed rentals for housing – improvements to the methodology for estimates of the data

The most significant developments affecting the household final consumption expenditure (HHFCE) data in Blue Book 2016 are the [improvements to imputed rentals for housing](#), which mainly affect Classification of Individual Consumption by Purpose (COICOP) 04.2.1 (imputed rentals of owner-occupiers) and COICOP 04.2.2 (other imputed rentals). They also affect UK tourists' expenditure abroad (TOURIM) and foreign tourists' expenditure in the UK (TOUREX).

A prime source for the previous estimates was the Living Costs and Food (LCF) survey. However, this was based on relatively small sample sizes and did not fully match the definitions required for imputed rentals estimation. Under the new method, current price estimates are based on housing stock from the Department for Communities and Local Government (DCLG) combined with price data from the Valuation Office Agency (VOA) for England and similar data from the devolved administrations. Chained volume measures are derived by applying the owner-occupiers' cost component of the Consumer Price Index including Housing (CPIH). These new sources make use of much larger sample sizes which allow stratification.

Revisions to current price levels from the imputed rentals improvements are smaller from 2010 onwards (see column c in Table 1). This is because we implemented an interim solution in Blue Book 2014, fixing the current price owner-occupiers imputed rentals series so that it grew in line with the slower-growing Owner-Occupiers CPIH index from 2010. Although this improved the series for the most recent periods, it also led to a discontinuity in the current price series which has now been removed by the full implementation of the new method.

Table 2 and Table 3 show the revisions to annual growth in imputed rentals for housing (COICOP 04.2), at current prices and chained volume measures respectively. Column d in each table shows the contributions to revisions to total HHFCE growth from the imputed rental improvements.

The revisions to HHFCE chained volume measures from the imputed rentals improvements are generally smaller than the revisions at current prices. This is because the source of the volume data is unchanged.

As part of the imputed rentals development, the historic imputed rentals series have been updated back to 1948. The chained volume measures from 1948 to 1996 have been produced using the existing paths. From this, the current price data for 1985 to 1996 have been derived using the owner-occupier component of CPIH. Current price data has been revised back to 1948 by modelling the revision to minimise the change to the growth rates.

The articles [Changes to National Accounts: Imputed Rental](#) published 23 March 2016 and [Impact of methods changes to the national accounts and sector and financial accounts: Jan to Mar 1997 to Jan to Mar 2016](#) published 30 June 2016, give further details of these changes.

Table 2: Imputed rental improvements, impact on current price household final consumption expenditure growth

UK, 1998 to 2014

Year	Imputed rentals for housing (COICOP 04) % growth			Contribution to total HHFCE revisions
	Previously Published	BB16	Revision	
	a	b	c	d
1998	11.9	3.0	-8.9	-1.2
1999	7.4	5.1	-2.3	-0.3
2000	7.9	4.1	-3.8	-0.6
2001	6.1	3.8	-2.3	-0.3
2002	6.7	2.6	-4.1	-0.6
2003	4.9	3.6	-1.3	-0.2
2004	7.7	2.9	-4.8	-0.7
2005	6.9	3.9	-3.0	-0.4
2006	4.6	3.0	-1.6	-0.3
2007	7.5	3.2	-4.3	-0.6
2008	5.3	3.1	-2.2	-0.3
2009	9.7	0.6	-9.1	-1.0
2010	17.6	1.3	-16.3	-1.9
2011	3.0	1.3	-1.7	-0.7
2012	2.3	2.8	0.5	0.1
2013	3.3	3.2	-0.1	0.0
2014	3.3	3.9	0.6	0.1

Source: Office for National Statistics

Table 3: Imputed rental improvements, impact on chained volume household final consumption expenditure growth

UK, 1998 to 2014

Year	Imputed rentals for housing (COICOP 04) % growth			Contribution to total HHFCE revisions
	Previously published	BB16	Revision	
	a	b	c	
1998	2.1	0.7	-1.4	-0.5
1999	2.0	2.9	0.9	-0.1
2000	1.7	1.7	0.0	-0.3
2001	1.1	1.5	0.4	-0.1
2002	1.9	0.7	-1.2	-0.4
2003	1.7	3.4	1.7	0.2
2004	1.2	1.4	0.2	-0.1
2005	0.7	1.0	0.3	-0.1
2006	0.9	0.3	-0.6	-0.2
2007	0.9	0.7	-0.2	-0.1
2008	0.9	0.4	-0.5	0.0
2009	1.5	-0.3	-1.8	-0.1
2010	1.1	2.3	1.2	0.6
2011	1.0	-0.2	-1.2	-0.5
2012	0.9	1.1	0.2	0.0
2013	1.9	1.7	-0.2	0.0
2014	1.5	2.4	0.9	0.2

Source: Office for National Statistics

5. Concealed income and VAT fraud

Adjustments to HHFCE to allow for economic activity concealed for tax evasion purposes were applied for the first time in the Blue Book 2015 data. These adjustments are outlined in Ellis (2015). There are updates to the adjustments in the Blue Book 2016 HHFCE data, based on estimates of missing Corporation and Income Tax published by HM Revenue and Customs (HMRC) in their [Measuring tax gaps 2015 publication](#). The impact on the Blue Book 2016 data at current prices is shown in column d of Table 1.

For Blue Book 2016, adjustments have also been made for the impact of VAT fraud on HHFCE. The resulting revisions to total current price HHFCE are shown in column e of Table 1.

The COICOP classifications most affected by the revisions from concealed income and VAT fraud estimation include:

03.1.2 – Garments
11.1.1 – Catering services
11.2 – Accommodation services
12.7 – Other services not elsewhere classified

There is also a small effect on the estimates for COICOP 12.2 – Prostitution.

Adjustments for both concealed income and VAT fraud have been applied via Supply and Use balancing.

6. Prostitution: Number of estimated working weeks

The assumed number of weeks worked per year by prostitutes has been reduced from 52 to 40. This matches the assumption made by the Netherlands Central Bureau of Statistics (CBS) which has conducted research into this area. The revisions equate to a reduction of 23.0% to current price levels in all periods. There is no impact on growth in the prostitution component and minimal impact on total HHFCE growth at current prices and chained volume measures.

In addition to the direct impact on COICOP 12.2 (prostitution), there are small secondary impacts on HHFCE for other goods and services, including clothing. These secondary impacts are all upward. They arise because some of the expenditure on these items is assumed to be part of the costs associated with prostitution (as opposed to households' final consumption) and this element has been reduced in line with downward revisions to HHFCE on prostitution.

Column f in Table 1 shows the net impact on total HHFCE at current prices from the revisions to the estimates for prostitution.

7. Supply and Use balancing

Supply and Use balancing takes place annually to ensure that estimates of UK gross domestic product (GDP) are balanced across the production, income and expenditure approaches. It reconciles the estimates from each of the approaches, taking into account the relative strengths of each. Supply and Use product balancing takes place at Classification of Products by Activity 2008 (CPA 2008) level and the estimates produced are matched to COICOP products, reallocating total balanced HHFCE across COICOP categories. Further details can be found in Annex A.

For Blue Book 2016, Supply and Use-balanced estimates of GDP from 1997 to 2013 were revised and data for 2014 went through the process for the first time.

For 1997 to 2011, there was a reassessment of the balancing adjustments to take account of improvements to methods and updated estimates of concealed income only. For 2012 and 2013, balancing adjustments were reassessed to take account of improvements to methods, updated estimates of concealed income and later survey data, including later data from our Annual Business Survey. The updates to Supply and Use balancing in 2012 and 2013 to take account of later survey data are included in "Other" contributions to revisions in column g in Table 1. The figure for 2014 in this column includes revisions attributable to 2014 going through Supply and Use balancing for the first time.

8. Other contributions to revisions: further details

Contributions to current price revisions from causes other than the specific developments outlined above are shown in column g in Table 1. Most of the largest of these revisions are for 2012 to 2014. The bulk of the revisions to 2012 and 2013 are due to reassessment of existing Supply and Use balancing adjustments. The remainder are predominantly due to later source data. Revisions to 2014 are more evenly split between Supply and Use balancing and later source data.

The COICOP categories most affected by these other revisions include:

03.1 – Clothing
05 – Furnishings, household equipment and routine household maintenance
08 – Communication
09 – Recreation and culture
10 – Education

9. Developments affecting quarterly data in Blue Book 2016

Revisions to quarterly aggregate household final consumption expenditure (HHFCE) figures are primarily driven by the same developments affecting annual figures, as have been explained in previous sections.

Comparisons between Blue Book 2016 data and previously published quarterly seasonally adjusted growth in current prices and chained volume measures for total HHFCE are shown in Figures 3 and 4 respectively.

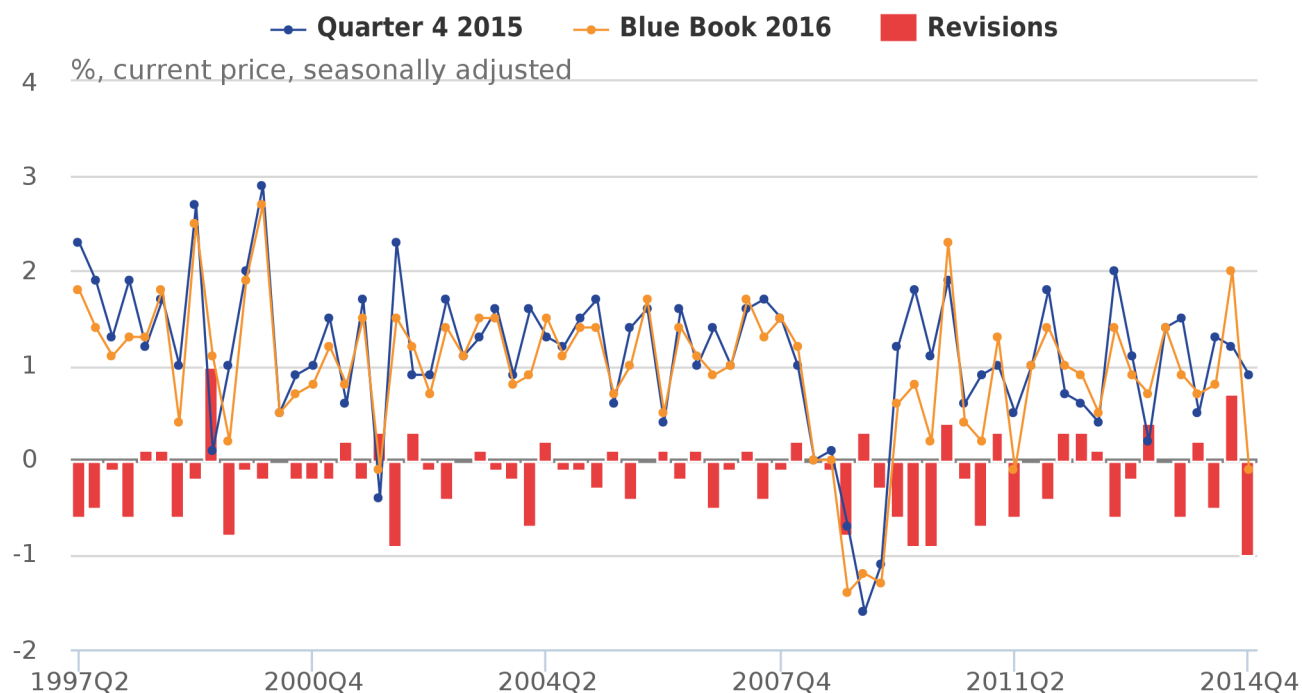
The average revision to quarterly current price growth from Quarter 2 (April to June) 1997 to Quarter 4 (October to December) 2014, is -0.2 percentage points. Within this, revisions range from -1.0 percentage points in Quarter 4 2014 to +1.0 percentage points in Quarter 2 1999.

The average revision to quarterly chained volume measures growth over the same period is 0. Within this, revisions range from -0.9 percentage points in Quarter 1 (January to March) 2002 to +1.0 percentage points in Quarter 2 1999.

We have also conducted a seasonal adjustment review across all of HHFCE which has an impact on the quarterly path of data from 1997 onwards.

Figure 4: Quarterly household final consumption expenditure growth rate, comparison between Blue Book 2016 and previous estimates

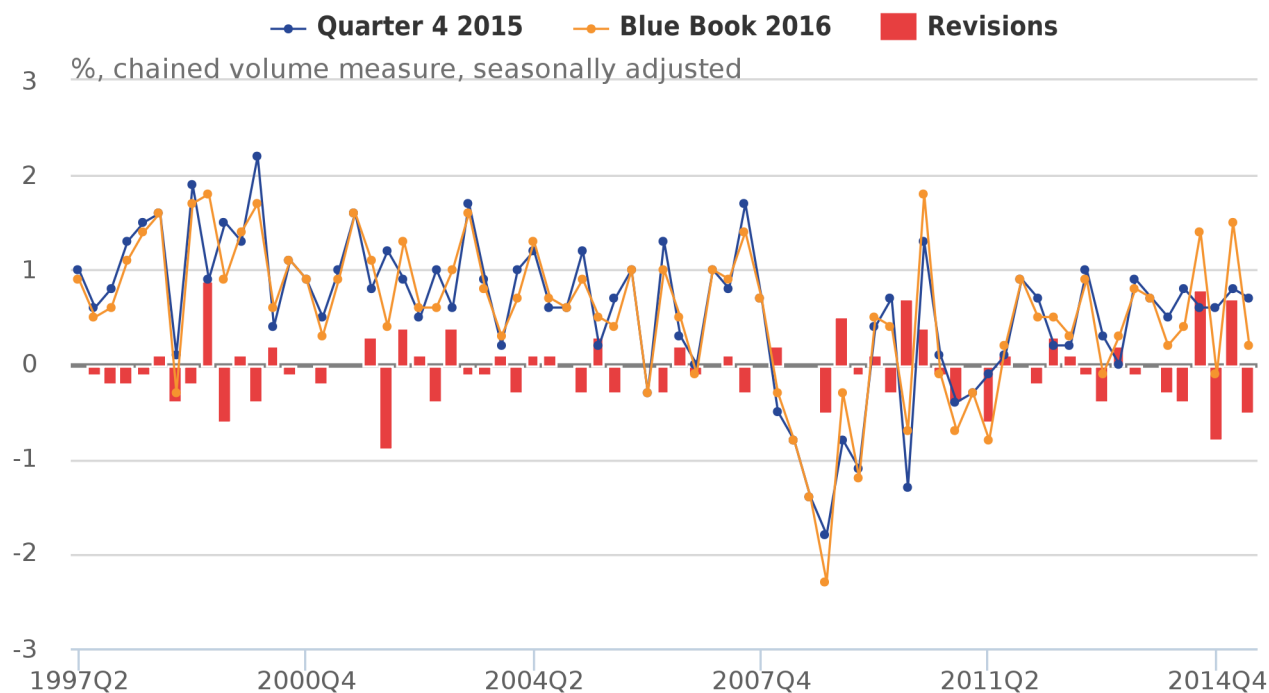
UK, 1997 to 2014



Source: Office for National Statistics

Figure 5: Quarterly household final consumption expenditure growth rate, comparison between Blue Book 2016 and previous estimates

UK, 1997 to 2014



Source: Office for National Statistics

10. Future plans

We plan a number of developments to household final consumption expenditure (HHFCE) statistics in the next few years:

- Improvements to methodology for the measurement of Actual Rental to bring it in line with the new methodology for the measurement of Imputed Rental
- Further improvements to the sources and methods for illegal activities such as narcotic drugs and smuggling
- Investigating the scope to further improve the use of administrative data
- Improvements to methods for the deflation of alcohol data

11. References

Bean, C (11 March 2016): [Independent Review of UK Economic Statistics](#)

Ellis, S and Skipper, H (23 September 2016): [Changes to National Accounts Blue Book 2015: Improvements to Household Expenditure Estimates](#)

Powell, G, Skipper, H and Vassilev, G, (23 March 2016): [Changes to National Accounts:Imputed Rental](#).

12. Annex A – The Supply and Use balancing process

Supply and Use tables provide the framework for ensuring supply and demand estimates in the National Accounts system are consistent. They are compiled annually at current prices and use data from the production, expenditure and income approaches to GDP (gross domestic product), taking account of the relative strengths of each. The aim of Supply and Use balancing is to produce a coherent and balanced estimate of GDP in current prices.

The Supply tables explain how products are supplied in the domestic economy. The Use tables explain how products are consumed in the form of intermediate and final expenditure by sector. They are compiled based on 2 identities which together state that total supply in the economy is equal to total demand in the economy. As a component of the expenditure approach, HHFCE estimates, along with other expenditure components, are “balanced” so they equal the production and other supply side estimates.

Supply and Use tables are produced for each industry and for each product within the economy. The 2016 Blue Book data publishes the National Accounts consistent with the UK Standard Industrial Classification of Economic Activities 2007 (SIC 2007) and the Classification of Products by Activity 2008 (CPA 2008).