Methods Changes in the 2011 Blue Book

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Summary

This article summarises the main changes being introduced in this year's annual production of the Blue Book and related publications. It provides information on the key changes to systems and methods, data revisions and functional modifications. It concludes with an outline of future work and improvements.

Introduction

Definitive estimates of gross domestic product (GDP) are produced by reconciling and balancing annual estimates of expenditure, income and production in current prices through the input-output framework. The input-output framework consists of the regularly produced supply and use tables and input-output analytical tables. The supply and use tables are compiled around 18 months after the year in question, when comprehensive information on expenditure, income and production becomes available.

The expenditure, income and production approaches are based on different survey and administrative data sources, and each produces estimates that, like all statistical estimates, are subject to variability. Accordingly, the three approaches produce different estimates, although theoretically they should be the same. A single, definitive, GDP estimate can only emerge therefore after a process of balancing and adjustment.

In the 2011 edition of the UK Blue Book (BB11), significant changes will be introduced: new industrial and product classifications (SIC07 and CPA08 respectively), improved methods of deflation and some additional improvements, largely in improved methods for the financial services and planned revisions to data. In particular, a significant new industrial classification (SIC07) is being introduced across Europe under regulation. The UK is meeting this requirement with the production of this year's Blue Book.

To incorporate these significant changes and to provide users a time series on the new industrial classification, data are being reclassified and converted as appropriate. This has required a systematic reclassification and rebalancing of the years from 1997 to 2009. This is a major undertaking.

Main methods changes

The annual Blue Book provides an opportunity to review methods and introduce improved methodology, and the opportunity to revise the base and reference year for data series. The improvements being introduced in BB11 are described in more detail below.

Industrial reclassification – BB11 will be published for the first time using the revised Standard Industrial Classification 2007 (SIC07) in keeping with EU regulations. These revisions are motivated by the need to adapt the classifications to changes in the structure of the economy. Some outputs have already moved to the new industrial classification, for example the Retail Sales Index has been on SIC07 since January 2010.

Key changes in SIC07 include a number of new sections giving more service sector detail. Under the new SIC, manufacturing is significantly reduced as a proportion of economic activity, which reflects the move towards more services-based economies over the past 20 years. For details see Hughes et al (2009). 'Implementation of Standard Industrial Classification 2007: December 2009 update', *Economic and Labour Market Review*, December 2009, Volume 3, No 12.

To incorporate these changes and to provide users a time series on the new SIC07 basis, data on the previously published SIC03 basis are being converted using factors provided by the ONS's Business Register, where businesses are classified on the old and new basis. The main correlator for these changes is turnover. This is used as a starting point for the adjustments, with some additional manual adjustments made using available additional information. This will provide a time series back to 1997 on the new SIC07 basis – the data from 2008 onwards are 'real' SIC07 data (ie collected using the new classification).

Product reclassification – The statistical Classification of Products by Activity (CPA) is the classification of products (goods as well as services) at the level of the European Union. Product classifications are designed to categorize products that have common characteristics. They provide the basis for collecting and calculating statistics on the production, distributive trade, consumption, foreign trade and transport of such products. A major revision of the CPA was adopted in April 2008.

New concepts, such as originals and intellectual property products have been introduced, and further detail has been added to reflect new products and emerging services. Simultaneously, efforts have been made to maintain the structure of the classification in all areas that do not explicitly require change based on new concepts. The detail has substantially increased, from 2,608 to 3,142 subcategories.

We use product information across many areas of the National Accounts. In particular, product details are used from the Producer Price Index (PPI) and the Services Producer Price Index (SPPI) in deflating current price information.

Deflation – The volume growth of GDP – sometimes referred to as the real growth rate - is one of the most important economic indicators. Changes in current price GDP between any two periods can be caused either by a price change or a change in the volume of economic activity or a combination of the two. For many purposes, it is important to know which. By removing the effect of price change, the volume change can be derived. The process of deflation, which removes the effect of price changes, is used for this purpose.

As part of the improvements being introduced to improve the quality of the UK National Accounts, ONS will introduce two key improvements to the methods by which volume estimates of gross domestic product (GDP) are calculated. The first will be the harmonisation of the deflators used across the accounts. The second is replacement of Retail Price Index (RPI) series with Consumer Price Index (CPI) series in forming the deflators.

In the past, price indices have been used to construct deflators for the components of the output measure of GDP, while similar price indices have been separately combined to provide deflators for the expenditure components of GDP. While efforts have been made to avoid inconsistencies, this approach is clearly undesirable. In future, rather than a piecemeal approach to deflation in

different systems, consistency will be established by having a common gateway for deflators through the short-term output based measure of GDP, referred to as GDP(O). In general, the GDP(O) system will hold the source deflators and produce domestic output deflators for the 112 products which the National Accounts now identify. These series will be used as the basis for the deflators in the majority of other systems, and thus ensure improved consistency between the output and expenditure deflators.

In addition, BB11 will change to using the conceptually better Consumer Prices Index (CPI) instead of the Retail Price Index (RPI), where applicable, to meet best practice and in line with Eurostat's Price and Volume Handbook. The CPI is designed to be consistent with the European System of National Accounts. This should ensure greater consistency across all National Accounts compiler areas, thus further improving the coherence of the Accounts.

The basic theory and expected impact of changing the basis of the prices previously used (RPI) to using price changes from the CPI is that it will raise volume GDP. For more detail regarding changes to deflation see Drew (2011) *'Deflation Improvements in the UK National Accounts'*. However, a number of additional changes are being made alongside the change to deflator that will impact on the estimates.

Financial services improvements – BB11 will contain some improvement to financial services data. These improvements stemmed from the *Better financial statistics for policy* project (see January 2011 edition of ELMR – 'Developing financial statistics for policy - Progress report January 2011'). Generally the improvements replace existing data sources and methodology with more reliable ones but have little overall impact on top level GDP. These include an improved data source for derivatives.

Adjustments – The production of the National Accounts necessarily involves the application of data adjustments and balancing items, as recognised in international rules and guidance. There are many reasons for applying data adjustments, ranging from low level quality adjustments, to adjustments used to aid the alignment of high level series or balance aggregate economic series according to agreed practices.

The application of adjustments in the processes of production is not new. However, ONS has taken the opportunity, synchronised with the development and use of new systems for the production of the UK's National Accounts, to review the categorisation and application of data adjustments. The new adjustment process will be used for the first time in the production of the 2011 Blue Book.

The new categorisation provides the benefit of clearer and more standardised recording of adjustments. The classification has also been aligned more directly with the adjustments required in the gross national income (GNI) process tables that the UK must provide periodically to Eurostat. Internal analysis and interpretation of the accounts should also be aided by the new categorisation.

There have also been changes to the stage at which some adjustments are applied, in line with the changes to production introduced with the new systems, and to resolve some current production difficulties.

Other – Some other minor revisions will be incorporated, for example where new data are available to replace buffers or estimated/forecast data. They cover, for example, areas such as child trust funds and social security administration.

Revisions

The introduction of new data and methodological changes into the National Accounts is carefully managed. Revisions for the most recent three years reflect a range of routine annual revisions, including the annual benchmarking exercise to incorporate new and revised current price data as part of the regular supply and use tables and other methodological improvements (see above).

In Blue Book 2011, 2009 will be balanced for the first time through the input-output supply and use framework and 2007 and 2008 will be fully rebalanced. The years 1997-2006 will be revised using relevant conversion factors for the changes to the new industrial classification and include additional changes as a result of revisions and changes to industry weights as a consequence of new industry and product classifications.

New base and reference year

The reference year and base year will both be 2008, moving from 2006 and bringing them back to normal practice and completing the catching up of the lag which had opened up in earlier years. The base year is the year in which constant price series are expressed. The reference year is the year indexed to 100. The significance of the base year is that the data will reflect prices and industry weights from 2008.

Functional changes

The new IT platform, CORD, uses SAS and Oracle and has been designed by ONS for use with time series. It will provide improvements in quality control, efficiency of work processes and business resilience, as well as enabling the methods changes previously detailed. The new system is more integrated, making better use of source data, and provides more clarity on any adjustments made during the compilation of the Accounts.

In addition, the new system for producing National Accounts incorporates a number of new time series functions. The main change is the shift to use X12 ARIMA instead of X11 ARIMA for seasonal adjustment. The use of X12 ARIMA has also been extended in forecasts (replacing HOLTWIN) and smoothing (replacing Henderson).

Impact

As noted earlier, there will be many changes impacting on both the current price and volume measures of National Accounts. It will be difficult to separate and isolate precisely the impact of each change. Some changes impact on the data in opposite directions. We will attempt to provide full explanations of change when we publish relevant data series, starting with the Quarterly National Accounts consistent with Blue Book to be published on 5 October.

This year's Blue Book will introduce the new level of detail in the National Accounts. There will be detail available for 112 industries and 112 products. In particular, this level of detail is the basis at which the Supply-Use tables are constructed and balanced and that detail is consistently used across nearly all systems. These levels will also be consistent with the levels required for Eurostat – thus streamlining production of data and improving UK's compliance with regulations.

The reclassification of industries to the new classification should not have affected the overall level of GDP nor particular industries where there is a direct one-to-one relationship. However, this change has not been undertaken in isolation, thus some one-to-one relationships will be broken. The changes to classifications of industries and products have also been affected by other methodological changes and revisions to data. The changes impact on the weights of each

industry and changes the mix of products, thus requiring the rebalancing of the Supply-Use tables that will impact on levels of GDP.

Historic data

The 2011 Blue Book is going to introduce large scale change to both IT systems and classifications. ONS is going to give users of these publications a similar end product but with the additional changes previously described. However, it will be necessary to withdraw some of the historical detail where it has proven to be very difficult to maintain consistency, but ONS will put extra efforts into implementing improvements to the more recent periods for all series, including improved analysis, more articles explaining the reasons for data movements, and better access to the data for users to be able to produce their own analyses. This access will be made possible by enhancements being made to the ONS web site.

The Quarterly National Accounts to be published on 5 October will contain historic data back to 1997. Prior to 1997 the core dataset for GDP will include all the key components of output, income and expenditure with data available annually back to 1948 and quarterly back to 1955 and we will release these data as they become available.

Future work

The production of National Accounts requires the balancing of three independent measures of GDP – Production, Expenditure and Income. Because of this and the various sources of data involved in the estimates, the dataset is never perfect. In theory, all measures should be the same but the various data sources often contain weaknesses such as incomplete coverage (eg very small businesses) or areas that are very difficult to measure but should be included, such as fraud and other illegal activities. Therefore the aim is to adjust relevant data to obtain the best estimates that reflect economic reality.

Future work plans are already being developed to take forward work that could not been completed in this year's Blue Book but expected to be incorporated in the 2012 edition. These include improvements to the deflation methods used with the Gross Fixed Capital Formation (GFCF) system were one part of the planned changes to be introduced in Blue Book 2011. This involved a change from using high level industry level deflation to product level deflation which was then re-weighted up to industry level. For GFCF estimates, analysis of the historical data highlighted that additional quality assurance would be needed before implementing this new approach for historical estimates. The existing deflation methodology will be used for historical data until further quality assurance is completed. To ensure consistency across the National Accounts, the best available deflation methodology will be used for upcoming quarterly estimates.

Other plans include improvements to the Trade data, particularly the deflation methods. The implementation of new insurance methodology is also planned for next year along with the introduction of the Whole Government Accounts (WGA).

ONS's future work programme also includes plans for the introduction of the new European System of Accounts (ESA) in 2014. Detailed plans for the implementation of ESA10 are being formulated and will be published when ready.

Conclusion

This article describes the main changes being introduced in this year's Blue Book and outlines some future work planned. BB11 will meet several key milestones:

- It will be the first time that the National Accounts will be published using the revised Standard Industrial Classification 2007 (SIC07), providing an expanded coverage of the Service Sector.
- Similarly, it will be the first time that the National Accounts will be published using the revised Classification of Product by Activity 2008 (CPA08).
- Improved deflation methodology will be incorporated.
- The National Accounts will use an integrated production system on a new IT platform.
- The reference year and base year will both be 2008, bringing them back to normal practice and completing the catching up of the lag which had opened up in earlier years.

Contact information

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