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BANK OF ENGLAND

Seasonal adjustment: results of 2012 annual review

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This regular article reports on the 2012 annual review of the seasonal adjustment of the Bank of England's money and credit data and other series. It also describes related work.

Introduction

Seasonal adjustment aims to identify, estimate and remove regular seasonal fluctuations and typical calendar effects (e.g. numbers of trading days in a month) from time series data.

Since 2004, the Bank of England has been using X-12-ARIMA to seasonally adjust data, and to review the seasonal adjustment settings for selected series on an annual basis. The results from each review have been detailed in a series of articles in this publication. This article presents the results of the three phases of the review conducted in 2012.

In addition, this article describes ongoing work related to seasonal adjustment.

Table 1: Phases of the annual review

Phase	Type of series covered	Period reviewed
1	Broad money and credit, notes and coin	Data up to January 2012 (implemented May 2012)
2	Balance sheet, industry analysis of deposits and loans, capital issuance, housing equity withdrawal and other series	Data up to May 2012 (implemented September 2012)
3	Lending to individuals	Data up to September 2012 (implemented January 2013)

Annual Review Process

The annual review of seasonally adjusted series is currently divided into three phases spread across the year, as detailed in Table 1. Overall, 274 series were reviewed in 2012 as shown in Table 2.

Table 2: Summary of results of 2012 annual review

Number of series reviewed	**274**
Seasonal series – settings reviewed (this includes reviewing whether the series should still be seasonally adjusted)	174
Non-seasonal series reviewed for seasonality	56
Indirectly adjusted series reviewed for residual seasonality	44

For each data series reviewed, the following issues were considered:

- presence of seasonality;
- seasonal adjustment settings:
    - ARIMA model choice;
    - calendar effects;
    - outliers;
    - seasonal and trend filters;
    - presence of 2002 Golden Jubilee and 2012 Diamond Jubilee effects ("Lending to individuals" series only); and
- direct versus indirect adjustment structure (selected series only).[1]

[1] Some series can be adjusted either directly or indirectly (as the sum, or less frequently the difference, of their seasonally adjusted components). The method chosen depends on various properties of the series and its components, and the relationships between these. The Bank continues to monitor

Of the 274 series reviewed, settings were changed for 122 series. This is an increase on the 2011 review, [2] when only 66 series were changed. This is mainly because 53 series were updated to include the new Jubilee regressors. While revisions were generally small, revisions due to Jubilee related changes were sometimes larger. All changes were introduced with immediate effect in the months following the end of the review phase (May 2012, September 2012 and January 2013). Table 3 presents a summary of the changes.

Table 3: Summary of changes made during the 2012 annual review

Total number of series changed	**122**
Changed from seasonal to non-seasonal	4
Changed from non-seasonal to seasonal	8
Seasonal adjustment settings changed (including Jubilee changes)	53
Seasonal adjustment settings changed (other than Jubilee changes)	57
Direct/Indirect adjustment structure changed	0

Ongoing work

In addition to the regular review process, the Bank also conducts more general work on issues relating to seasonal adjustment:

- As mentioned above, the Bank has implemented a new approach for the seasonal adjustment of statistics affected by the 2012 Diamond Jubilee,[3] where the usual pattern of bank holidays changed. Changes were applied to the "Lending to individuals" series in January 2013 following phase 3 of the 2012 review. A continuing programme of review for the Jubilee effect will cover further series in phases 1 and 2 of the 2013 review.

- The Bank is reviewing the seasonal adjustment of M4 excluding intermediate OFCs ($M4^{ex}$). Due to the short length of the monthly time series (starting in June 2009), an alternative approach is currently applied.[4] At present, over three years of data are available and the Bank is reviewing whether it is possible to seasonally adjust this series using standard methods. Subject to a satisfactory outcome of this review, a transition to a consistent monthly presentation of these data will be considered later in 2013.

- The Government Statistical Service (GSS) Task Force on evaluating the X-13ARIMA-SEATS seasonal adjustment package (in which both the Bank and the Office for National Statistics (ONS) participated) has now concluded, with its final report recommending that GSS members (which include the ONS but not the Bank) begin to use X-13ARIMA-SEATS within a specified time frame. The Bank is planning to switch over to the new program within the next eighteen months.

the adjustment structures of key series to ensure that these remain appropriate.

[2] See 'Seasonal adjustment: 2012 update', by Eleanor Broughton and Jenny Owladi, *Bank of England Bankstats (Monetary & Financial Statistics),* May 2012, available at: http://www.bankofengland.co.uk/statistics/Documents/ms/articles/art2may12.pdf.

[3] For further details, see 'Seasonal adjustment: Effects of the 2012 Diamond Jubilee', by Jenny Owladi, *Bank of England Bankstats (Monetary & Financial Statistics),* January 2013, available at: http://www.bankofengland.co.uk/statistics/Documents/ms/articles/art3jan13.pdf.

[4] Also see 'Seasonal adjustment of M4 excluding intermediate OFCs (M4ex) - an update', by Robert Gilhooly and Fida Hussain, *Bank of England Bankstats (Monetary & Financial Statistics),* November 2010, available at: http://www.bankofengland.co.uk/statistics/Documents/ms/articles/art1nov10.pdf.