Seasonal adjustment: 2009 annual review

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This article is the latest in an annual series reviewing the seasonal adjustment of the Bank of England’s published series. It outlines the scope of the review and summarises the changes made. In addition, it introduces seasonally adjusted series for Table A5.5 - Monthly Lending Secured on Dwellings: Repayments.

Introduction

The Bank recently published its Data Quality Framework which sets out the Bank’s approach to meeting international quality standards for statistics. Comparability of data over time is enhanced through the application of seasonal adjustment methods and the Bank continues to conduct reviews of the seasonal adjustment settings of all of its monetary data series to ensure these remain satisfactory.

Seasonal adjustment aims to identify, estimate and remove regular seasonal fluctuations and typical calendar effects (e.g. trading day) within the movements of the time series under review. Regular seasonal fluctuations mean those movements which recur with similar intensity in the same season each year and which, on the basis of the past movements of the time series in question, can under normal circumstances be expected to recur.

The 2009 Annual Review

The 2009 review focussed on:

- Series that appear on the Bank’s statistical releases, including those currently classed as non-seasonal;
- A selection of less prominent series where X-12-ARIMA diagnostic tests indicated that the existing seasonal adjustments could be refined in some way; and

A larger number of series than in the past were reviewed this year partly as a consequence of reviewing more non-seasonal series but also because a change in settings for a particular series may have merited a review of related series. As discussed below, new series have been introduced in this publication following the decision to begin seasonally adjusting the Lending secured on dwellings (Repayments) series. A change to the method of adjustment for M4 (net) lending to the Household sector is also documented below. These changes have been introduced in the current edition of this publication when data for March 2009 are first published.

Table 1 summarises the main changes following the review. Thirty series had their settings left unchanged and a significant number of changes were warranted partly reflecting the decision to begin seasonally adjusting the Lending secured on dwellings (Repayments) series. A change to the method of adjustment for M4 (net) lending to the Household sector is also documented below. These changes have been introduced in the current edition of this publication when data for March 2009 are first published.

Introduction of seasonally adjusted data in Table A5.5 – Monthly Lending Secured on Dwellings: Repayments

Analysis of the 16 series in this table shows that 14 exhibit seasonality. As a result, these series will from now on be seasonally adjusted and have been added to Table A5.5. The Table splits these repayments by type (regular, on redemption, and other lump sum) and by lender (banks, building societies and other specialist lenders). Totals, including a gross total, by type and lender are also presented.

X-12-ARIMA’s statistical procedures, including F tests and a spectral diagnostic, were used to detect seasonality and significant calendar effects e.g. trading day. The quality of the seasonal adjustment is satisfactory with no residual seasonality present in either component or aggregate series. Two series: Other Specialist Lenders regular repayments and Other Specialist Lenders other lump sum did not exhibit seasonality. These series will,

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1 See [http://www.bankofengland.co.uk/statistics/about/dqf.pdf](http://www.bankofengland.co.uk/statistics/about/dqf.pdf)

2 Some of these series are non-published internal series which do not appear on the Bank’s Statistical Interactive Database
however, be reviewed for seasonality regularly along with all other series.

M4 (net) Lending to Household Sector

The sectoral split of M4 Lending (a counterpart to the broad money aggregate M4) includes the M4 (net) Lending to Household Sector aggregate. Since 2004, when the Bank changed seasonal adjustment methods\(^3\), the M4 (net) Lending to Household Sector aggregate has been directly adjusted.

When a time series is constructed as the sum (or other composite) of a set of component series, the seasonally adjusted total series can be obtained by summing the individually seasonally adjusted components. This kind of adjustment is known as an indirect adjustment of the aggregate series. The alternative is direct adjustment which is found by seasonally adjusting the aggregate series. Direct adjustment is generally of better quality than the alternative indirect adjustment when the component series are noisy but display similar seasonal patterns. An indirect adjustment is usually of better quality than the direct adjustment when the component series have quite distinct seasonal patterns or when the proportion of the total that a component accounts for changes over time. Generally the direct and indirect adjustment will not coincide and the Bank publishes a residual series, on the Statistical Interactive Database, when an aggregate total is directly adjusted.

Chart 1: Aggregation structure of M4 Lending to Household

Chart 1 shows how components (some of these in turn having their own sub-components) combine to give the M4 Lending to the Household sector series. Each of the totals (shaded) can be derived using either a direct or indirect adjustment.

Analysis showed that both the direct and indirect methods yielded satisfactory results: no residual seasonal or calendar effects, and an absence of bias in the level of the series. To bring consistency with the analogous M4 Lending to Households (excluding securitisations and loan transfers) series the indirect approach will be adopted now.

X-12-ARIMA updates and future reviews

The United States Census Bureau (USCB) shortly plan to release an X-13A-S test package to interested parties including the Bank and the UK’s Office for National Statistics (ONS). The Bank will participate in a Government Statistical Service (GSS) Task Force to evaluate the impact of the new package on published data.

The Bank will continue to routinely monitor the seasonal adjustment performance of its monetary series and document significant changes in this publication.

\(^3\) See [http://www.bankofengland.co.uk/statistics/ms/articles/artdec03.pdf](http://www.bankofengland.co.uk/statistics/ms/articles/artdec03.pdf)