

Seasonal adjustment of monetary data: annual review

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The Bank of England has recently reviewed the seasonal adjustment of its monetary data. This article outlines the scope of this review and summarises the changes made.

When the Bank changed the method of seasonal adjustment of its monetary statistics,¹ it also stated that the options chosen for seasonally adjusting each series would be reviewed annually. The first annual review has now taken place using data to end-December 2004; data published from the April 2005 version of this publication onwards reflect the resulting changes.

The intention of the review was to identify whether, with the addition of an extra year of data, the existing options were still appropriate or whether different options would improve the seasonal adjustment of individual series. As a first step, all series, including those that had not been adjusted so far, were re-assessed to determine whether they are now significantly seasonal. For those that are not, the seasonally adjusted data will be the same as the unadjusted data.

For each series that is significantly seasonal, the Bank uses X-12-ARIMA to determine the best options for seasonal adjustment. Among the options available are: the choice of ARIMA model; the inclusion of trading-day and Easter regressors;² and the length of trend and seasonal filters. It is the Bank of England's policy to fix (adjust for) outliers as soon as they are identified, to remove all fixed outliers at the time of the annual review, and then to fix only those that are again identified as outliers at this time.

Results of the review

A total of 281 series were reviewed, of which 161 were unchanged. Table 1 summarises the changes resulting from the annual review.

Table 1³

Change	Number of series
Now significantly seasonal	8
Now not significantly seasonal	2
Model	66
Outliers	39
Now include trading-day/Easter effect ⁴	10
Now exclude trading-day/Easter effect ⁴	7
Now indirectly adjusted	2

¹ Announced in 'Change in seasonal adjustment method to X-12-ARIMA', Bank of England, *Monetary and Financial Statistics*, December 2003, pages 4-8.

² These regressors perform a calendar adjustment of the series, removing the effects of the day of measurement of a series (i.e. the last day of the month), the number of working days in the month (for a series adjusted directly as a flow), and the position of Easter.

³ Series affected by multiple changes are included more than once.

⁴ Series that have changed to or from calendar adjustment are most likely to be those where its effect was or is minimal, as typically the significance of the adjustment factors was borderline.

Review of trading-day regressors

Some of the regression variables available for calendar adjustment were refined in this review. The regressors used to adjust for trading-day effects in levels series give information to X-12-ARIMA based on the last day of the month so that X-12-ARIMA can take account of the typical fluctuations in the level of a series through the week. For example, a series constructed from hypothetical bank accounts in which money accumulates through the week and is spent at the weekend will have low levels on a Monday, but high levels on a Friday. The Friday level will be sustained through the weekend as transactions are carried forward to the Monday. On average, months ending on a Monday will need a boost to their level through a calendar adjustment, whereas months ending on a Friday, Saturday or Sunday will need a reduction (with months ending on other days adjusted accordingly). In months where the last day is a Bank Holiday Monday, the Friday level will also apply to that Monday, and the usual calendar adjustment will boost this level further unless the trading-day regressors are altered.

The first month that ended on a Bank Holiday Monday since the change to X-12-ARIMA was May 2004. At the time, the Bank applied temporary adjustments to the series that were most affected – aggregate M4, household M4 and private sector holdings of notes and coin. In this review the Bank has changed the regressors such that X-12-ARIMA treats these months in the same way as months that end on a Sunday.

Updates to X-12-ARIMA

The December 2003 article stated that the Bank would consider whether to introduce any updates to X-12-ARIMA that had been released. Since the implementation of X-12-ARIMA, updates have been restricted to the diagnostic and model selection capabilities of X-12-ARIMA, and as such have had no direct impact on the calculation of the seasonally adjusted data.

Future reviews

The Bank will re-assess the scale and frequency of future reviews of seasonal adjustment of the monetary statistics in light of the results of this exercise.