

NI Index of Production Methodological Note to explain differences in published series (from Q1 2014) due to moving from X-12 ARIMA to X-13 ARIMA SEATS for Seasonal Adjustment

Background

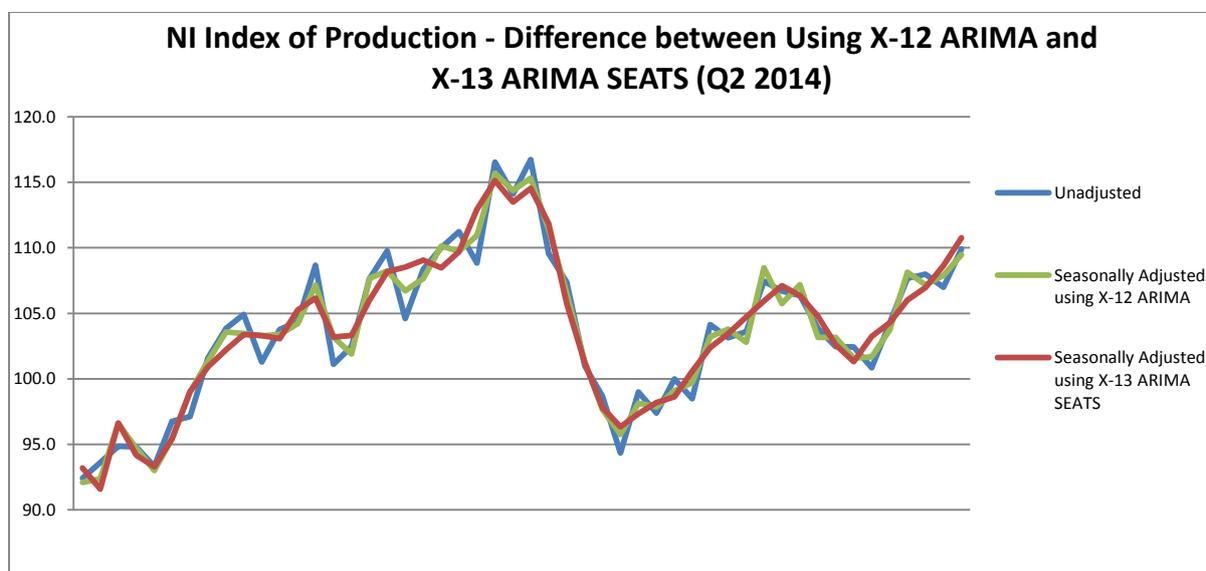
The NI Index of Production (IOP), like many sub-annual time series, can be difficult to analyse because short-term movements are often dominated by seasonal fluctuations and other calendar/trading-day effects. This can mask relevant changes in the series and impede a clear understanding of economic phenomena. Consequently, the series are seasonally adjusted by identifying and removing the seasonal component, thus leaving the trend and irregular components. Therefore, seasonally adjusted data help to reveal the “news” contained in a time series.

The Northern Ireland Index of Production

Up to and including Quarter 1 2014, the NI IOP was seasonally adjusted using X-12 ARIMA. From Quarter 2 2014 the IOP results are seasonally adjusted using X-13 ARIMA SEATS. This is in line with earlier recommendations from the Government Statistical Service, a task force of which had evaluated the use of X-13 ARIMA SEATS against X-12 ARIMA and determined that any differences between results were due to increased modelling facilities in X-13 ARIMA SEATS.

All of the series of sectors and sub-sectors that make up the NI IOP are tested through the seasonal adjustment package in order to determine whether there is any seasonality in the series and where the program indicates, the series is seasonally adjusted.

There are marginal differences between results when seasonally adjusted using X-12 ARIMA and X-13 ARIMA SEATS and the below chart helps to illustrate this.



The chart shows that X-13 ARIMA SEATS further reduces fluctuation compared with X-12 ARIMA and this is largely due to the enhanced modelling that is carried out within X-13 ARIMA SEATS incorporating more refinements and better assumptions than X-12 ARIMA.

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Annual Review

Every year the NI IOP is reviewed and each series is assessed individually to determine the type of adjustment to be used, identifying the seasonal pattern, and investigating any other effects in the data that are not strictly seasonal. Factors used to adjust for the seasonal pattern are updated quarterly by the adjustment program. Other effects in the series that are not strictly seasonal have to be investigated and quantified outside the program.

Move from Smoothing to Seasonal Adjustment for Sector D

The Electricity, gas, steam and air conditioning supply sector (Sector D) has historically been subject to a smoothing methodology due to the particular volatility of the sector. During the annual seasonal adjustment review and the move to X-13 ARIMA, advice was sought from time series experts in the Office for National Statistics on this historical approach to Sector D and it was determined that the Sector D index was a good candidate for seasonal adjustment.

The graph below compares the series on a smoothed unadjusted basis using X-12 ARIMA i.e. as published at Q1 2014, with the new approach of unsmoothed data which is seasonally adjusted using X-13 ARIMA SEATS. The series also incorporates an improved link factor between Q1 and Q2 2011 when the IOP sample refresh took place. This link factor takes account of average changes over Q1 to Q2 in the unsmoothed back-series. Link factors to the other seasonally adjusted sub-sectors have also been revised slightly on this basis.

