Interactive Adjustment and Outlier Detection of Time Dependent Data in R
Contents

Motivation

The R-package x12

The R-package x12GUI
Motivation

- X12-ARIMA is widely used and state-of-the-art in many statistical offices
- Statistical offices (we) have to apply seasonal adjustment frequently and to many different time series
- Graphical analysis should always be included in the process
- Results should be reproducible and easy to modify

→ R-packages x12 and x12GUI
Features

- Access to X12-ARIMA directly from within R (no .spc, .out, ... files)
- Class oriented command line interface
- Change tracking for the X12-ARIMA parameters and output
- Batch processing of multiple time series at once
- Easy generation of graphical output
- Import the parameter setting from spc files to R
Class x12Single

Objects of class x12Single contain the following information:

- **ts** - The original time serie
- **x12Parameter** - The current X12-ARIMA parameter setting
- **x120output** - The current X12-ARIMA results
- **x1201dParameter** - All previous X12-ARIMA parameter settings
- **x1201d0output** - All previous X12-ARIMA results

Methods for this class are:

- **X12** - (Re)Run X12-ARIMA
- **setP, getP** - Change/View parameters
- **prev, cleanHistory** - Revert to a previous X12 parameter setting and output
- **plot, plotRsdAcf, plotSpec, plotSeasFac** - Plot methods
Objects of class `x12Batch` combine multiple objects of class `x12Single` and inherit their methods.
Plot functions I

- Output of the `plot()` method showing trend and forecasts with prediction intervals as well as the seasonally adjusted series.
Output of the `plotRsdAcf()` function from the R package `x12`, showing the autocorrelations of the squared residuals from the regARIMA model.

![Graph of Autocorrelations of the Squared Residuals](image)
Plot functions III

Output of the `plotSpec()` function, showing the spectrum of the seasonally adjusted series.

Spectrum of the Seasonally Adjusted Series
Output of the seasonal factor plot (`plotSeasFac()`).

Seasonal Factors by period and SI Ratios

- Seasonal Factors
- Mean
- SI Ratio
- Replaced SI Ratio
Output of the `plot()` method showing outliers in the RegARIMA model.
Features x12GUI

- Overview of all (implemented) X12-ARIMA parameters
- Interactive adjustment of the parameters
- Interactive graphics
- Visualisation of the automatically detected outliers
- Easy addition, removal of manually selected outliers
Main View x12GUI

1. Manual Outliers
2. History
3. Transform
4. Series 1
5. Plot
6. Summary Table
Graphics x12GUI
Interactive Plots x12GUI