DEUTSCHE BUNDESBANK
EUROSYSTEM

Elementary seasonal adjustment of economic data with JDemetra+: Module V – Summary

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Virtual Seminar Series, 19-23 October 2020

Aims

Theory

- Basic understanding $\rightsquigarrow$ Ideas, concepts
- Approach $\rightsquigarrow$ X-11
- Pretreatment $\rightsquigarrow$ RegARIMA models

Application

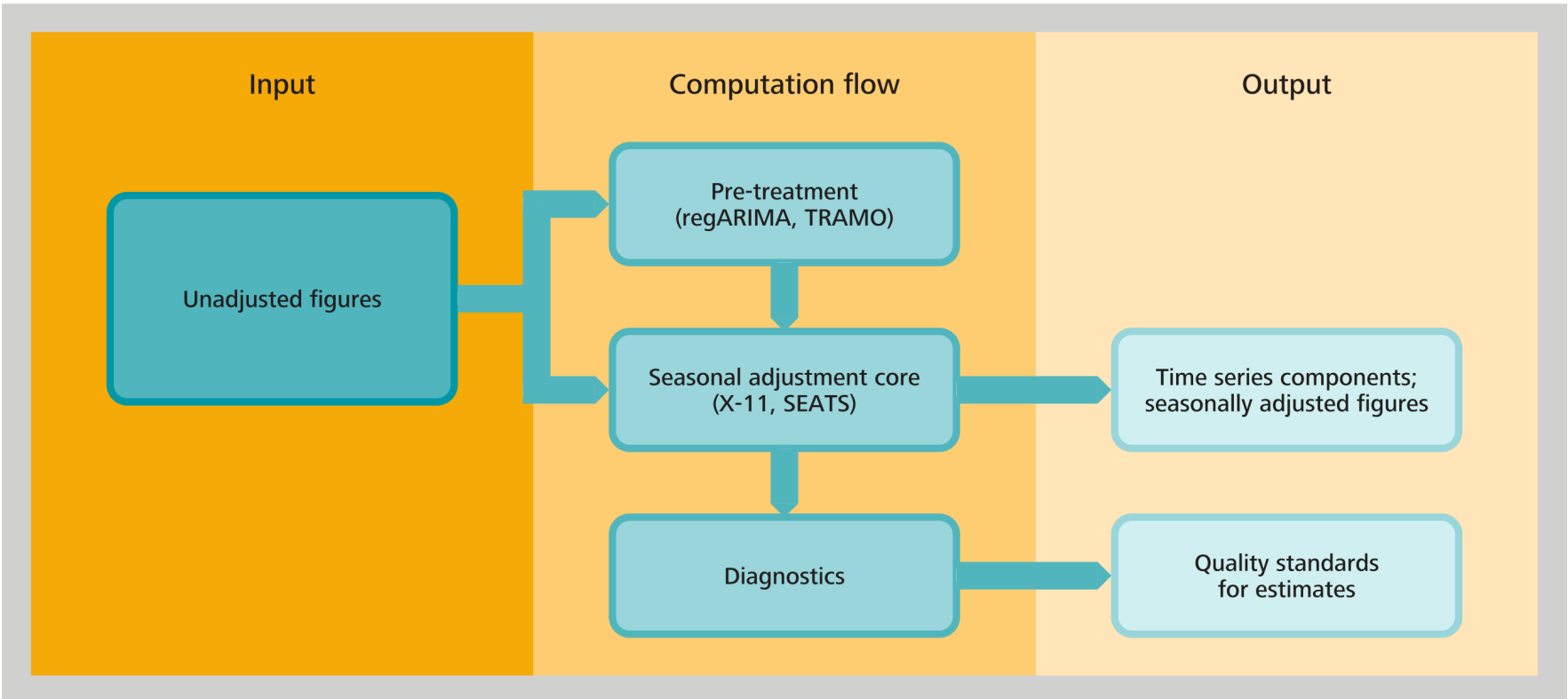
- Software $\rightsquigarrow$ JDemetra+ (JD+)
- Specification $\rightsquigarrow$ Options
- Results $\rightsquigarrow$ Interpretation, quality assessment

Discussion

- Your questions $\rightsquigarrow$ Practical problems

Road map

Structure of JDemetra+



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Seasonal adjustment

Goal

- Data $\rightsquigarrow$ Extraction of news

Seasonally adjusted (SA) data

- Components $\rightsquigarrow$ Trend-cycle, irregular
- Calendar effects $\rightsquigarrow$ Permanent elimination
- Outliers $\rightsquigarrow$ Temporary removal (except for seasonal outliers)

Cautionary remarks

- SA effects $\rightsquigarrow$ Non-seasonal data dynamics
- SA data $\rightsquigarrow$ Careful use in econometric models
  - Business cycle analysis, cointegration & unit root tests, log-periodogram regression

Visibility in seasonally adjusted data

Seasonal influences

- Deviation $\rightsquigarrow$ Normal seasonal average
- Extreme weather conditions, atypical holiday constellations, etc.

Random disruptions, unusual movements

- Understandable $\rightsquigarrow$ Economic terms
- Large-scale orders, strikes, etc. $\rightsquigarrow$ Outliers

Revisions

- Unadjusted data $\rightsquigarrow$ Corrections, new observations
- SA approach $\rightsquigarrow$ Methodological changes

Data errors

Seasonal adjustment in practice (I/II)

Step 1: look at your data

- Time series plot $\rightsquigarrow$ Visual outliers & seasonal behaviour
- Seasonality diagnostics $\rightsquigarrow$ ACF/PACF, spectral graphs, tests

Step 2: prepare your data for seasonal adjustment

- Log transformation, outliers, calendar effects $\rightsquigarrow$ Smoothing ("linearisation")
- ARIMA model $\rightsquigarrow$ Identification
- First guess $\rightsquigarrow$ Automatic procedures
- Second guess $\rightsquigarrow$ Expert knowledge (especially outliers & calendar effects), regARIMA residual analysis

Seasonal adjustment in practice (II/II)

Step 3: seasonally adjust your pretreated data

- Specification $\rightsquigarrow$ "Best" parameters
- X-11 approach $\rightsquigarrow$ Trend & seasonal filters, extreme SI ratio detection

Step 4: check your seasonally adjusted data

- Residual seasonality $\rightsquigarrow$ Absence
- Quality diagnostics $\rightsquigarrow$ See Step 1

Outlook: companion level II course

Advanced topics in seasonal adjustment

- Date $\rightsquigarrow$ 7-11 December 2020

Selected topics

- Outliers $\rightsquigarrow$ Modelling during strong economic changes
- Calendar effects $\rightsquigarrow$ User-defined regression variables
- Seasonal adjustment $\rightsquigarrow$ ARIMA model-based approach, composite time series, daily data, revision policies
- JD+ $\rightsquigarrow$ Access via R