Generalitat de Catalunya
**Institut d'Estadística de Catalunya**

# Evolving with JDemetra+

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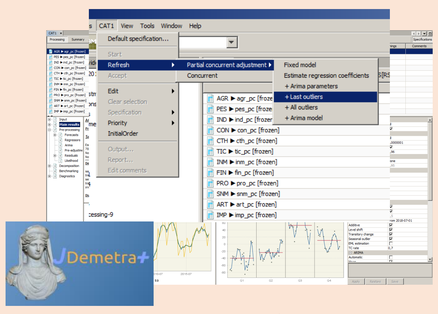
**Idescat** (Statistical Institute of Catalonia) has combined the graphical interface of JDemetra + with custom extensions of the released R-interfaces (**jdemetra-R**, **JDLight** and **RJDemetra**) to obtain a solid architecture for a **medium-scale statistical production**.

## QUARTERLY NATIONAL ACCOUNTS – GDP FLASH

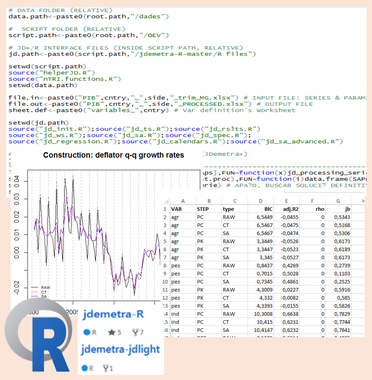
**Before 2015** →

- Manual seasonal adjustment with TSW.
- Temporal disaggregation in Matlab (E.M. Quilis).
- Process driven by Excel sheets and formulas.

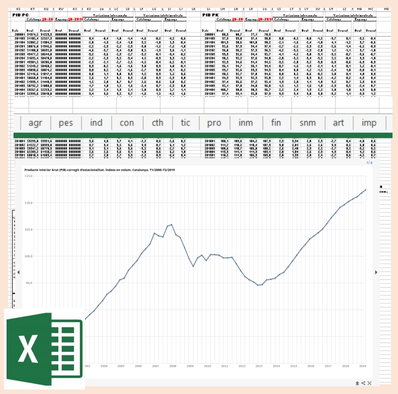
**2018** **Process driven by R scripts**: first stage.




JDemetra+ GUI: partial concurrent adjustment of indicators and deflators




R: workspaces **reading** and aggregates **computation**



Microsoft Excel: final GDP chaining

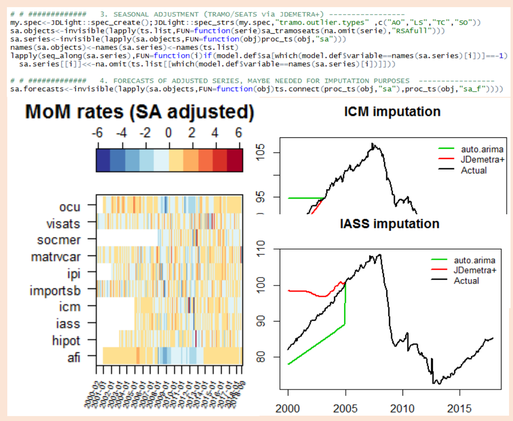
**NEXT** development stage → whole process with **RJDemetra.**

## GDP NOWCASTING

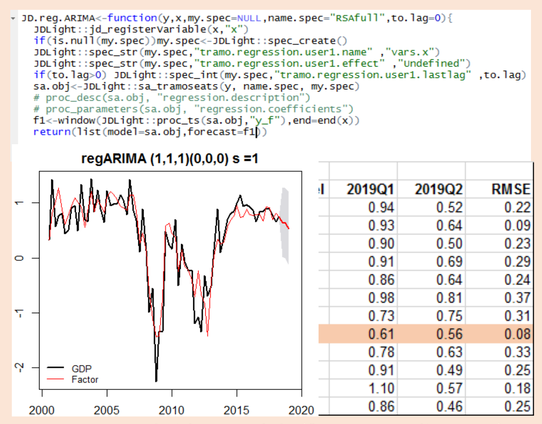
**2016** Development of 2 Factor Models (FM) inspired on
- the FASE model (spanish AIReF)
- the JDemetra+ plugging

**2017** Development of 3 bridges to predict GDP from factor(s).
Implementation of a battery of connectors for daily downloads.

**2018** New FM estimated from *MARSS* and *nowcasting* R-packages.
Nowcast generation based on a suite of 12 models (combination or selection?).


Concurrent adjustment and (maybe) imputations




| | 2019Q1 | 2019Q2 | RMSE |
|---|---|---|---|
| | 0.94 | 0.52 | 0.22 |
| | 0.93 | 0.64 | 0.09 |
| | 0.90 | 0.50 | 0.23 |
| | 0.91 | 0.69 | 0.29 |
| | 0.86 | 0.64 | 0.24 |
| | 0.98 | 0.81 | 0.37 |
| | 0.73 | 0.75 | 0.31 |
| | 0.61 | 0.56 | 0.08 |
| | 0.78 | 0.63 | 0.33 |
| | 0.91 | 0.49 | 0.25 |
| | 1.10 | 0.57 | 0.18 |
| | 0.86 | 0.46 | 0.25 |

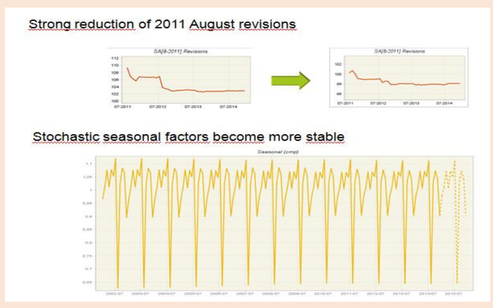
Reg-ARIMA bridge models (factors predict GDP)

## SEASONAL ADJUSTMENT OF SHORT-TERM INDICATORS: MAIN ACHIEVEMENTS


**2014** Producing with **TRAMO/SEATS** (TSW), we started the **JDemetra+ 1.5.1** GUI evaluation.

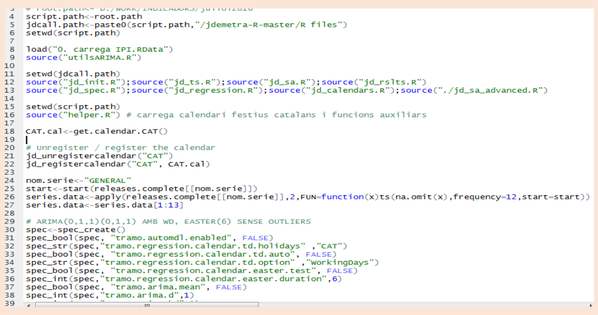
**2015** JDemetra+ and TSW comparisons: GUI use, parameterization, calendar regressors and results.

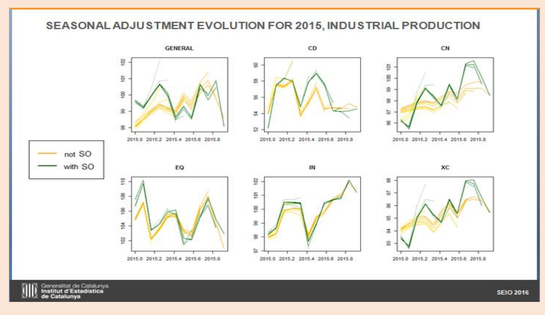
**2016** With the help of the **SACE,** and extending some methods of the **jdemetra-R interface** (JDemetra+ 2.1.0), we performed a wide analysis of **seasonal outliers** (SO) effects on industrial production and services activities indexes adjustments.





JDemetra+ GUI: single analysis






jdemetra-R interface: group analysis

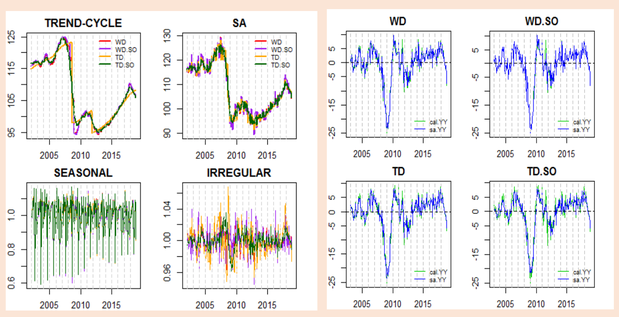
**2017** Extension of a custom package based on the **JDLight** and **jdemetra-R interface** fusion, developed for versions 2.1 and 2.2 of JDemetra+:

- Creation of functions for setting an automatic seasonal adjustment output as an input specification for another one.
- Creation of functions for national calendars management: validity periods and weights.

Modelization - Intensive simulation functions for assessing:

- the impact of adding/removing a single national calendar day
- Trading Days/Working Days specifications
- revisions and model stability
- effects of Easter duration
- scheme sensibility (log/level)
- effects of the raw data revisions

JDLight and jdemetra-R auxiliar functions

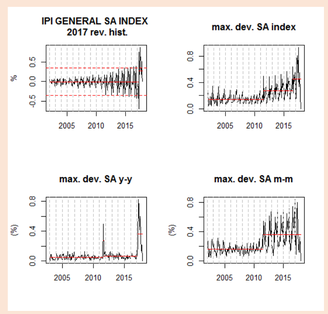



Components and YoY rates **consistency** of 4 models



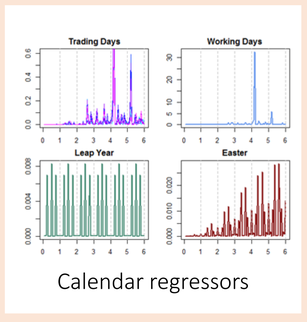

| | TRADING DAYS | | | | WORKING DAYS | | | |
|---|---|---|---|---|---|---|---|---|
| holiday | auto model | BIC | LY | BTH | auto model | BIC | LY | BTH |
| 1-January | (011)(011) | -6.8062 | 0.0321 | -0.3350 | (200)(010) | -6.8135 | 0.0275 | |
| 6-January | (011)(011) | -6.8570 | 0.0322 | -0.3253 | (011)(011) | -6.7427 | 0.0276 | -0.4294 |
| Easter -2 | (011)(011) | -6.8951 | 0.0320 | -0.3366 | (011)(011) | -6.8004 | 0.0279 | -0.4261 |
| Easter 1 | (011)(011) | -6.8239 | 0.0318 | -0.3763 | (011)(011) | -6.7759 | 0.0298 | -0.4335 |
| 1-May | (011)(011) | -6.8542 | 0.0321 | -0.3364 | (011)(011) | -6.8422 | 0.0272 | -0.3987 |
| 24-June | (011)(011) | -6.8435 | 0.0318 | -0.3375 | (200)(010) | -6.7744 | 0.0259 | |
| 15-August | (011)(011) | -6.9095 | 0.0328 | -0.3400 | (011)(011) | -6.8625 | 0.0275 | -0.4162 |
| 11-September | (200)(010) | -6.7082 | 0.0301 | | (200)(010) | -6.8097 | 0.0261 | |
| 12-October | (011)(011) | -6.8414 | 0.0311 | -0.3356 | (200)(010) | -6.8282 | 0.0253 | |
| 1-November | (300)(010) | -6.7525 | 0.0330 | | (200)(010) | -6.6772 | 0.0265 | |
| 6-December | (011)(011) | -6.9716 | 0.0296 | -0.3197 | (011)(011) | -6.7777 | 0.0269 | -0.4503 |
| 8-December | (011)(011) | -6.8403 | 0.0321 | -0.3187 | (011)(011) | -6.7993 | 0.0279 | -0.4037 |
| 25-December | (200)(010) | -6.7611 | 0.0313 | | (200)(010) | -6.8300 | 0.0290 | |
| 26-December | (011)(011) | -6.9553 | 0.0323 | -0.3216 | (011)(011) | -6.8784 | 0.0283 | -0.3851 |
| 23-May | (011)(011) | -6.9041 | 0.0318 | -0.3291 | (011)(011) | -6.8048 | 0.0277 | -0.4193 |
| 16-May | (011)(011) | -6.9032 | 0.0318 | -0.3299 | (011)(011) | -6.7956 | 0.0276 | -0.4233 |
| 13-June | (011)(011) | -6.9039 | 0.0318 | -0.3293 | (011)(011) | -6.8050 | 0.0277 | -0.4211 |
| 16-May | (011)(011) | -6.9032 | 0.0318 | -0.3299 | (011)(011) | -6.7930 | 0.0278 | -0.4255 |
| NONE | **(011)(011)** | **-6.9041** | **0.0318** | **-0.3291** | **(011)(011)** | **-6.8048** | **0.0277** | **-0.4193** |

Effects of omitting national holidays

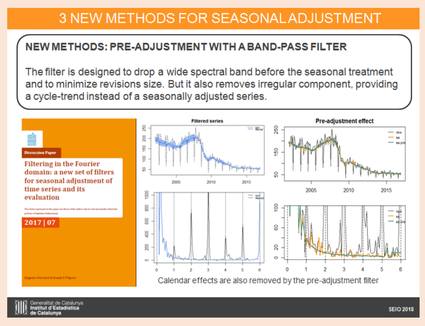


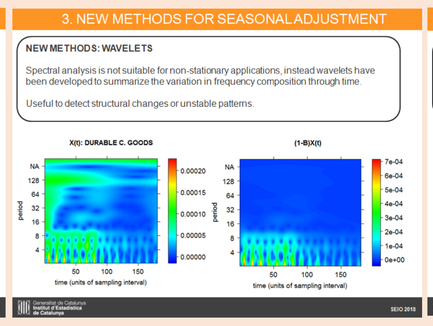

Assessing revisions sizes

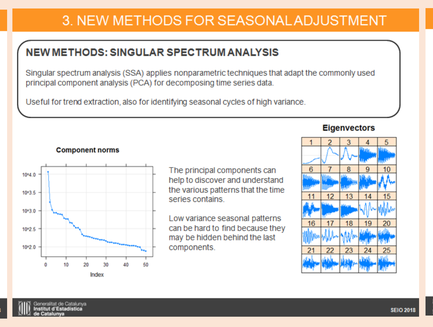
**2018** Analysis of the process **spectral properties:** comparisons with the **Direct Filter Approach** (DFA) and other spectrum-based adjustment methods:

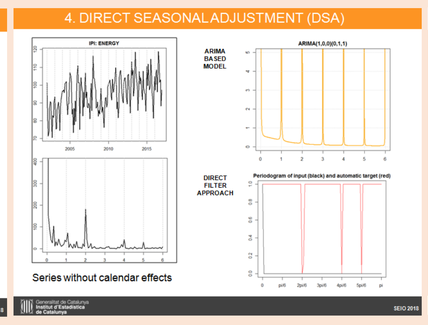


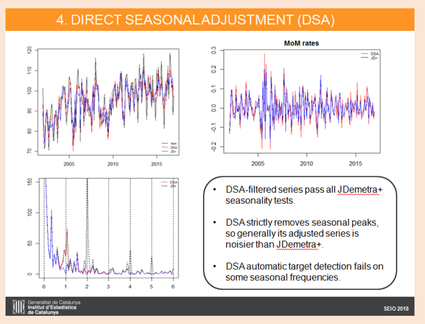

Calendar regressors



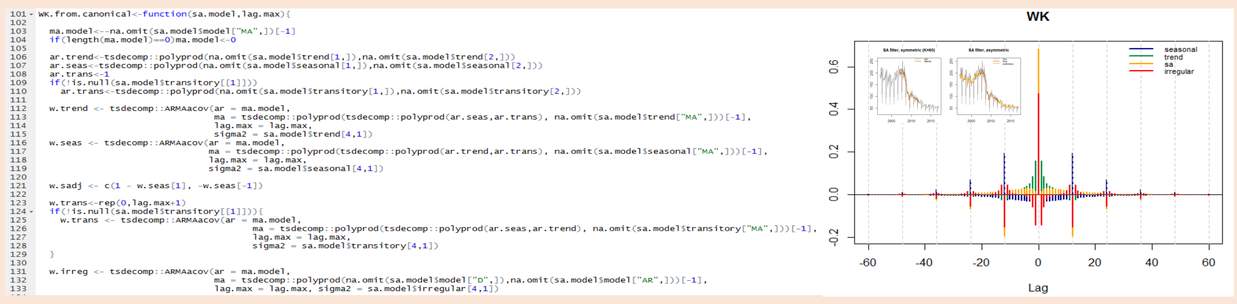




**2019** Derivation of the **Wienner-Kolmogorov** filter weights from the canonical decomposition provided by the **RJDemetra** package.

**Production system** developed with **RJDemetra**:

- partial concurrent revision from the JDemetra+ GUI.
- an R-script reads the workspace and perform all posterior transformations: base year adjustment, exportation formats, custom summaries...




WK filter weights computation: the canonical decomposition is the input for the **tsdecomp** package functions

Monthly production R-script