

Package ‘rjdqa’

October 4, 2023

Type Package

Title Quality Assessment for Seasonal Adjustment

Version 0.1.2

Description Add-in to the 'RJDemetra' package on seasonal adjustments.

It allows to produce dashboards to summarise models and quickly check the quality of the seasonal adjustment.

License EUPL

SystemRequirements Java (≥ 8)

Depends R ($\geq 3.1.1$), RJDemetra,

Imports plotrix, ggdemetra, utils, graphics, stats

Encoding UTF-8

URL <https://github.com/AQLT/rjdqa>

RoxygenNote 7.2.3

NeedsCompilation no

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deprecated-rjdqa *Deprecated functions*

Description

Use [sc_dashboard] instead of [sa_dashboard()].

Usage

```
sa_dashboard(x, n_recent_obs = 24)
```

Arguments

x a seasonal adjustment model made by 'RJDemetra' (object of class "SA").

n_recent_obs number of observation in the recent history panel (see details). By default n_recent_obs = 24 (last 2 years for monthly data).

plot.sc_dashboard *Plot a Statistics Canada seasonal adjustment dashboard*

Description

Function to plot Statistics Canada dashboard of a seasonal adjustment model.

Usage

```
## S3 method for class 'sc_dashboard'
plot(
  x,
  main = "Seasonal Adjustment Dashboard",
  subtitle = "",
  reference_date = TRUE,
  raw_color = "#33A02C",
  sa_color = "#E31A1C",
  trend_color = "black",
  ...
)
```

Arguments

x a "sc_dashboard" object.

main main title.

subtitle subtitle.

reference_date boolean indicating if the reference date should be printed.

raw_color	color for the raw series.
sa_color	color for the seasonal adjusted series.
trend_color	color for the trend.
...	other parameters (unused).

Details

sa_model() reproduces Statistics Canada dashboard used to provide a snapshot snapshot of a single seasonal adjustment model at a point in time and to point out some possible problems (see references).

The dashboard is divided into four sections:

- Recent History (top left panel): plot of the raw series, the seasonal adjusted series and the trend for the most recent periods (n_recent_obs last observations: 24 by default). It is intended to identify trendF direction, overall volatility and obvious outliers.
- Summary of Key Diagnostics (top right panel):
 - Adjustability (only for X13 models): M7 statistic. Colors: red if $M7 > 1.75$, yellow if $1.25 < M7 < 1.75$ and green if $M7 < 1.25$.
 - Residual seasonality: qs (auto-correlations at seasonal lags) and f (Friedman) test on seasonal adjusted series. Colors: red if p-value < 0.01 , yellow if $0.01 < \text{p-value} < 0.05$ and green if p-value > 0.05 .
 - Residual trading-days effects: f (Friedman) test on seasonal adjusted serie. Colors: red if p-value < 0.01 , yellow if $0.01 < \text{p-value} < 0.05$ and green if p-value > 0.05 .
 - Independence of RegARIMA residuals: Ljung-Box test. Colors: red if p-value < 0.01 , yellow if $0.01 < \text{p-value} < 0.05$ and green if p-value > 0.05 .
 - Recent outliers on last (t) and penultimate (t-1) observation. Colors: Red if there is an extreme value (only for X13: when table C17 equals to 0), yellow if there is an outlier in the RegARIMA model and green otherwise.
- Estimated Patterns and Anticipated Movements (middle panel): estimated trading day, moving holiday and seasonal pattern. It presents expected movement in unadjusted series based on the current and previous period.
- Net Effect of Seasonal Adjustment (bottom panel): movement in the raw series, compared to typical ranges centered around “neutral” value (when the seasonal adjusted series of the last period is equal to the penultimate period). It also shows the movement in the seasonally adjusted series, compared to typical ranges.

References

- KIRCHNER R., LADIRAY D., MAZZI G. L. (2018), "Quality Measures and Reporting for Seasonal Adjustment", edited by G. L. Mazzi, co-edited by D. Ladiray, European Union, Luxembourg. <https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-18-001>
- MATTHEWS S. (2016), "Quality Assurance of Seasonal Adjustment for a Large System of Time Series", 36th International Symposium on Forecasting Santander, Spain.

See Also

[sc_dashboard](#).

Examples

```
data <- window(RJDemetra::ipi_c_eu[, "FR"], start = 2003)
sa_model <- RJDemetra::x13(data, "RSA5c")
dashboard_data <- sc_dashboard(sa_model)
plot(dashboard_data, main = "My first seasonal adjustment dashboard",
      subtitle = "SA with X13")
```

plot.simple_dashboard *Plot a simple seasonal adjustment dashboard*

Description

Function to plot a simple dashboard of a seasonal adjustment model.

Usage

```
## S3 method for class 'simple_dashboard'
plot(
  x,
  main = "Simple Dashboard",
  subtitle = NULL,
  color_series = c(y = "#F0B400", t = "#1E6C0B", sa = "#155692"),
  reference_date = TRUE,
  ...
)
```

Arguments

x	a "sc_dashboard" object.
main	main title.
subtitle	subtitle.
color_series	Color of the raw time series, the trend and the seasonally adjusted component.
reference_date	boolean indicating if the reference date should be printed.
...	other parameters (unused).

See Also

[simple_dashboard](#).

Examples

```
data <- window(RJDemetra::ipi_c_eu[, "FR"], start = 2003)
sa_model <- RJDemetra::jx13(data, "RSA5c")
dashboard_data <- simple_dashboard(sa_model)
plot(dashboard_data, main = "Simple dashboard IPI - FR")
```

sc_dashboard	<i>Compute data for the Statistics Canada seasonal adjustment dashboard</i>
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Description

Function to compute the data to produce the Statistics Canada seasonal adjustment dashboard

Usage

```
sc_dashboard(x, n_recent_obs = 24)
```

Arguments

x	a seasonal adjustment model made by 'RJDemetra' (object of class "SA").
n_recent_obs	number of observation in the recent history panel (see details). By default n_recent_obs = 24 (last 2 years for monthly data).

Details

sa_model() reproduces Statistics Canada dashboard used to provide a snapshot snapshot of a single seasonal adjustment model at a point in time and to point out some possible problems (see references).

The dashboard is divided into four sections:

- Recent History (top left panel): plot of the raw series, the seasonal adjusted series and the trend for the most recent periods (n_recent_obs last observations: 24 by default). It is intended to identify trend direction, overall volatility and obvious outliers.
- Summary of Key Diagnostics (top right panel):
 - Adjustability (only for X13 models): M7 statistic. Colors: red if $M7 \geq 1.75$, yellow if $1.25 \leq M7 < 1.75$ and green if $M7 < 1.25$.
 - Residual seasonality: qs (auto-correlations at seasonal lags) and f (Friedman) test on seasonal adjusted series. Colors: red if $p\text{-value} \leq 0.01$, yellow if $0.01 < p\text{-value} \leq 0.05$ and green if $p\text{-value} > 0.05$.
 - Residual trading-days effects: f (Friedman) test on seasonal adjusted serie. Colors: red if $p\text{-value} \leq 0.01$, yellow if $0.01 < p\text{-value} \leq 0.05$ and green if $p\text{-value} > 0.05$.
 - Independence of RegARIMA residuals: Ljung-Box test. Colors: red if $p\text{-value} \leq 0.01$, yellow if $0.01 < p\text{-value} \leq 0.05$ and green if $p\text{-value} > 0.05$.
 - Recent outliers on last (t) and penultimate (t-1) observation. Colors: Red if there is an extreme value (only for X13: when table C17 equals to 0), yellow if there is an outlier in the RegARIMA model and green otherwise.
- Estimated Patterns and Anticipated Movements (middle panel): estimated trading day, moving holiday and seasonal pattern. It presents expected movement in unadjusted series based on the current and previous period.

- Net Effect of Seasonal Adjustment (bottom panel): movement in the raw series, compared to typical ranges centered around “neutral” value (when the seasonal adjusted series of the last period is equal to the penultimate period). It also shows the movement in the seasonally adjusted series, compared to typical ranges.

References

KIRCHNER R., LADIRAY D., MAZZI G. L. (2018), "Quality Measures and Reporting for Seasonal Adjustment", edited by G. L. Mazzi, co-edited by D. Ladiray, European Union, Luxembourg. <https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-18-001>

MATTHEWS S. (2016), "Quality Assurance of Seasonal Adjustment for a Large System of Time Series", 36th International Symposium on Forecasting Santander, Spain.

See Also

[plot.sc_dashboard.](#)

Examples

```
data <- window(RJDemetra::ipi_c_eu[, "FR"], start = 2003)
sa_model <- RJDemetra::x13(data, "RSA5c")
sc_dashboard_data <- sc_dashboard(sa_model)
plot(sc_dashboard_data, main = "My first seasonal adjustment dashboard",
      subtitle = "SA with X13")
```

simple_dashboard	<i>Compute data for a simple seasonal adjustment</i>
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Description

Function to compute the data to produce a simple seasonal adjustment dashboard

Usage

```
simple_dashboard(x, digits = 2)
```

Arguments

x	a seasonal adjustment model made by 'RJDemetra' (object of class "SA").
digits	number of digits used in the tables.

See Also

[plot.sc_dashboard.](#)

Examples

```
data <- window(RJDemetra::ipi_c_eu[, "FR"], start = 2003)
sa_model <- RJDemetra::jx13(data, "RSA5c")
dashboard_data <- simple_dashboard(sa_model)
plot(dashboard_data, main = "Simple dashboard IPI - FR")
```

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