Package ‘Coinprofile’

August 25, 2019

Type Package
Title Coincident Profile
Version 0.1.9
Date 2019-08-22
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License GPL-2
Encoding UTF-8
LazyData TRUE
Imports zoo, stats, plyr, coin, Rdpack, exactRankTests (>= 0.8-29), ggplot2 (>= 1.0.1)
RdMacros Rdpack

Description Builds the coincident profile proposed by Martinez, W and Nieto, Fabio H and Poncela, P (2016) <doi:10.1016/j.spl.2015.11.008>. This methodology studies the relationship between a couple of time series based on the the set of turning points of each time series. The coincident profile establishes if two time series are coincident, or one of them leads the second.

RoxygenNote 6.1.1
Suggests knitr, rmarkdown

URL https://github.com/WilmerMartinezR/Coinprofile

BugReports https://github.com/WilmerMartinezR/Coinprofile/issues

NeedsCompilation no
Repository CRAN
Date/Publication 2019-08-25 07:20:09 UTC
coincident_profile

Description

Returns the coincident profile developed by Martinez et al. (2016). The ideal result is finding the maximum p-value for the lag = 0; otherwise maximum p-value for negative lags suggest leading from x to y, or maximum p-value for positive lags suggest leading from y to x.

Usage

```r
coincident_profile(x, y, frequ = 12, Mlag = 6, nvar1 = "name.x", nvar2 = "name.y", print.graf = FALSE, iyear = 1, lyear = numeric(), imonth = 12, lmonth = numeric(), tit1 = "Title.x", tit2 = "Title.y", tit3 = "Title.x.y")
```

Arguments

- `x`: Univariate time series
- `y`: Univariate time series
- `frequ`: Frequency of x and y. x and y must have the same frequency
- `Mlag`: Maximum lag for the coincident profile
- `nvar1`: Name of x
- `nvar2`: Name of y
- `print.graf`: If TRUE returns a panel 2x2 where the superior panel has both plots of x and y with their turning points (maximums black dots lines and minimums red dots lines). The inferior left panel has the matplot of x and y standardized, respectively (x-mean(x))/sd(x). The inferior right panel has the coincident profile where TP shows the number of turning points used.
- `iyear`: The year of the first observation. A single number
- `lyear`: The year of the last observation. A single number
- `imonth`: The amount of months for the first year. A single number
- `lmonth`: The amount of months for the last year. A single number
- `tit1`: Title for the plot x
- `tit2`: Title for the plot y
- `tit3`: Title for the plot x and y
**Details**

The main output contains two objects: the coincident profile (Profile) and both the lag which has the highest probability and the number of turning points considered to the calculus of the coincident profile (MainLag).

**Value**

The coincident profile

**Author(s)**

Wilmer O Martinez R

**References**


**Examples**

```r
set.seed(123)
w <- seq(-3, 7, length.out = 100)
x1 <- sin(pi*w)+rnorm(100,0,0.1)
x2 <- sin(pi*w-0.1)+rnorm(100,0,0.1)
coincident_profile(x1, x2, 4, 5, "name.x", "name.y", TRUE, 1991, 2015, 4, 4)
# In this example x leads y three periods

set.seed(123)
w <- seq(-3, 7, length.out = 100)
x <- sin(pi*w)+rnorm(100,0,0.1)
y <- sin(pi*w-1)+rnorm(100,0,0.1)
coincident_profile(x, y, 4, 6, "name.x", "name.y", TRUE, 1991, 2015, 4, 4)
```

**dif_TP**

**Closest differences**

**Description**

Finds closest differences between two sets of turning points

**Usage**

dif_TP(dato1, dato2, minmax = 1)
Arguments

dato1 A vector of data
dato2 A vector of data2
minmax Indicator variable 1 minimum, 2 maximum

Details

From Martinez et al. (2016): "When the number of turning points in the two time series that are being compared is not the same, we recommend choosing the pairs of turning points, i.e. peak–peak and trough–trough, in the following way: take the first peak of the first time series, then compute the chronological difference with each one of the peaks of the second time series and choose the peak in this time series that leaves the smallest algebraic difference. Now, consider the second peak of the first time series and compute the differences with all the peaks of the second one but the peaks that precedes the one chosen in the previous step. Take from the second time series that for which the difference is the smallest. This procedure for pairing peaks is repeated until either all the peaks in the first time series have been considered or all the peaks in the second series have been exhausted.”

Value

Differences between turning points

Examples

x <- rnorm(100)
y <- rnorm(100)
dif_TP(TP_BryBoschan(x),TP_BryBoschan(y))

TP_BryBoschan Turning points

Description

Calculates turning points of a time series using the Bry and Boschan (1971) methodology

Usage

TP_BryBoschan(x, frequ = 12, year = 1, month = 1)

Arguments

x univariate time series
frequ Frequency of the x, 12 monthly or 4 quarterly. Default value 12.
year The start year of the time series. Default value 1.
month The start month of the time series. Default value 1.
Value

The dates of the turning points

Author(s)

Wilmer O Martinez R

References


Examples

```r
x <- rnorm(100)
TP_BryBoschan(x)
```
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