Package ‘BCDating’

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Title Business Cycle Dating and Plotting Tools
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Description Tools for Dating Business Cycles using Harding-Pagan (Quarterly Bry-Boschan) method and various plotting features.
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Depends methods
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**BCDating-package**

*Business Cycle Dating and Plotting Tools*

**Description**

This package implements the Harding and Pagan algorithm that creates a quarterly dating from a univariate time series. Procedures for printing and plotting appropriate graphs are provided. Also the dating for business cycles of the economy of Iran (by MBRI, CBI) is provided.

**Details**

- **Package:** BCDating
- **Type:** Package
- **Version:** 0.9.8
- **Date:** 2019-01-06
- **License:** GPL-2
- **Depends:** methods

**Author(s)**

Majid Einian, <m.einian@mbri.ac.ir>,
Monetary and Banking Research Institute, Central Bank of Islamic Republic of Iran

**See Also**

BBQ, BCDating Class, avgts

**Examples**

```r
library(BCDating)
data("Iran.non.Oil.GDP.Cycle")
dat <- BBQ(Iran.non.Oil.GDP.Cycle, name="Dating Business Cycles of Iran")
show(dat)
summary(dat)
plot(dat)
plot(dat,Iran.non.Oil.GDP.Cycle)

data("MBRI.Iran.Dating")
plot(MBRI.Iran.Dating)
```
Description

This function returns the averages of the input time series over each of phases in the Dating. It omits the NA's in the time series, so will give an error with internal NA's.

Usage

avgts(ts,Dating)

Arguments

ts The input time series.
Dating The dating.

Value

A ts timeseries.

Author(s)

Majid Einian,<m.einian@mbri.ac.ir>,
Monetary and Banking Research Institute, Central Bank of Islamic Republic of Iran

Examples

data("Iran.non.Oil.GDP.Quarterly.Growth")
data("MBRI.Iran.Dating")
avggrowth <- avgts(Iran.non.Oil.GDP.Quarterly.Growth,MBRI.Iran.Dating)
cbind(avggrowth,Iran.non.Oil.GDP.Quarterly.Growth)
plot(MBRI.Iran.Dating,avggrowth)
plot(MBRI.Iran.Dating,Iran.non.Oil.GDP.Quarterly.Growth,averages=TRUE)
Description

This function implements the Harding and Pagan algorithm that creates a quarterly dating from a univariate time series.

Usage

BBQ(y, mincycle = 5, minphase = 2, name = "")

Arguments

y The input time series.
mincycle Minimum length of a cycle. default=5
minphase Minimum length of a phase of a cycle.default=2
name The name of the series or dating.

Details

See Reference paper.

Value

An object of class "BCDating". You can use show(), summary(), window(), and plot() on it.

Author(s)

Majid Einian,<m.einian@mbri.ac.ir>,
Monetary and Banking Research Institute, Central Bank of Islamic Republic of Iran
Franck Arnaud,
National Institute of Statistics and Economic Studies (INSEE), France

References

Examples

```r
data("Iran.non.Oil.GDP.Cycle")
dat <- BBQ(Iran.non.Oil.GDP.Cycle, name="Dating Business Cycles of Iran")
show(dat)
summary(dat)
plot(dat)
data(MBRI.Iran.Dating)
plot(dat,MBRI.Iran.Dating)
```

BCDating-class  

Class "BCDating"

Description

Class Designed for dating Business Cycles

Objects from the Class

A BCDating is basically a sequence of peaks and troughs. But it can also be represented as a discrete state process, with values such as -1 for recession and 1 for expansion phases. The BCDating class is designed to handle this kind of data: it can store, print and plot graphs of such data.

Use BBQ to create object of BCDating type from Quarterly Data.

Slots

- **name**: Object of class "character" The name of the Dating
- **states**: Object of class "ts" States of the Dating (-1 for recession and 1 for expansion phases)
- **peaks**: Object of class "numeric" Indices of Peaks
- **troughs**: Object of class "numeric" Indices of Throughs
- **y**: Object of class "ts" The Refernce Time Series (e.g. the GDP Cycle)
- **param**: Object of class "list" Parameters of the Dating (i.e. min phase and min cycle)
- **type**: Object of class "character" Dating Type

Methods

```r
plot,BCDating,missing-method,
plot,BCDating,ts-method,plot,ts,BCDating-method,
plot,BCDating,BCDating-method,plot,list,missing-method
```

Author(s)

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Franck Arnaud, National Institute of Statistics and Economic Studies (INSEE), France
Iran.non.Oil.GDP.Cycle

*Cycle of non-Oil GDP of Iran.*

**Description**

Cycle of non-Oil GDP of Iran. (Non-Oil GDP after x12, and HP filtering)

**Usage**

Iran.non.Oil.GDP.Cycle

**Format**

ts Quarterly Time Series

**Source**

Central Bank of Islamic Republic of Iran. Further calculations by Majid Einian

**References**


Iran.non.Oil.GDP.Quarterly.Growth

*Quarterly Growth of non-Oil GDP of Iran.*

**Description**

Quarterly Growth of non-Oil GDP of Iran. (after x12)

**Usage**

Iran.non.Oil.GDP.Quarterly.Growth

**Format**

ts Quarterly Time Series
**Source**

Central Bank of Islamic Republic of Iran. Further calculations by Majid Einian

**References**


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**Description**

This is the official Dating of Business Cycles of Iran by MBRI. This is not exactly what you get using **BBQ** on **Iran.non.Oil.GDP.Cycle** as there are some changes to that based on other economic facts. See reference paper for details.

**Usage**

```r
data(MBRI.Iran.Dating)
```

**Format**

BCDating Object

**Source**

Einian, M. and M. Barakchian (2014)

**References**


**Examples**

```r
data(MBRI.Iran.Dating)
plot(MBRI.Iran.Dating)
```
plot-methods

Plotting BCDating Objects, and Plotting Time-Series on BCDating
Plot Background

Description

Methods for function plot. Some arguments are not applicable to all methods, but most are common.

Arguments

dates If TRUE, plots the dates of peaks and troughs on the plot. default=FALSE
yearrep Number of digits a year is represented if dates are plotted (i.e. dates = TRUE), eg. yearrep = 2 plots dates like 72:3, and yearrep = 4 plots dates like 1372:3. default = 2
col.bg Background Color of Dating plot (i.e. the color for periods with unknown cycle state). default=gery(0.8)
col.exp Color for Expansions. default=grey(1)
col.rec Color for Recessions. default=grey(0.45)
main Main Title of the Plot, if not provided, the name of the Dating will be used. default=""
xlab Label of the X axis. default=""
ylab Label of the Y axis. default=""
lwd The line Width. default=2
cex Relative magnification factor. default=0.5
vert A vector of dates in which vertical lines should be plotted. default=NULL
col.vert Color of added vertical lines. default="darkblue"
windos If TRUE, plots the time series in the time horizon where the Dating is available, else plots the entire time series. default=FALSE
averages If TRUE, plots the averages of times series in each cycle phases. This can be either a vector with the length equal to number of time series in mts object, or just a single value, which would be used for all time series. default=FALSE
col Color of each of the time series plotted. This can be either a vector with the length equal to number of time series in mts object, or just a single value, which would be used for all time series. default="red"
Methods

signature(x = "BCDating", y = "missing") Plots a BCDating.
signature(x = "BCDating", y = "ts") Plot a Time-Series, (or multiple time series in case y’s class is mts) on a BCDating.
signature(x = "ts", y = "BCDating") Plot a Time-Series, (or multiple time series in case y’s class is mts) on a BCDating.
signature(x = "BCDating", y = "BCDating") Plots 2 BCDatings, so you can compare them.
signature(x = "list", y = "missing") Plots a list of BCDating Objects, so you can compare them.

Author(s)

Majid Einian, <m.einian@mbri.ac.ir>, Monetary and Banking Research Institute, Central Bank of Islamic Republic of Iran
Franck Arnaud, National Institute of Statistics and Economic Studies (INSEE), France

Examples

library(BCDating)
data("MBRI.Iran.Dating")
plot(MBRI.Iran.Dating)
plot(MBRI.Iran.Dating, dates=TRUE)

data("Iran.non.Oil.GDP.Cycle")
plot(MBRI.Iran.Dating, Iran.non.Oil.GDP.Cycle)
plot(Iran.non.Oil.GDP.Cycle, MBRI.Iran.Dating)

data("Iran.non.Oil.GDP.Quarterly.Growth")
plot(MBRI.Iran.Dating, Iran.non.Oil.GDP.Quarterly.Growth, averages=TRUE)
plot(MBRI.Iran.Dating, cbind(Iran.non.Oil.GDP.Cycle*100, Iran.non.Oil.GDP.Quarterly.Growth))

dat <- BBQ(Iran.non.Oil.GDP.Cycle, name="Dating Business Cycles of Iran")
plot(dat, MBRI.Iran.Dating)
plot(list(dat, MBRI.Iran.Dating))

show-methods

Showing a BCDating object

Description

Methods for function show

Methods

signature(object = "BCDating") Shows the dates of peaks and troughs of the BCDating.
Author(s)

Majid Einian, <m.einian@mbri.ac.ir>, Monetary and Banking Research Institute, Central Bank of Islamic Republic of Iran
Franck Arnaud

Examples

library(BCDating)
data("MBRI.Iran.Dating")
MBRI.Iran.Dating

summary-methods

Summerizing a BCDating Object

Description

Methods for function summary

Methods

signature(object = "BCDating") Lists the start and end dates of recessions and expansions in a BCDating, their duration, amplitude .... Also the average duration of expansions and recessions are printed.

Author(s)

Majid Einian, <m.einian@mbri.ac.ir>, Monetary and Banking Research Institute, Central Bank of Islamic Republic of Iran
Franck Arnaud

window-methods

Extracting a window of A BCDating

Description

Methods for function window

Methods

signature(x = "BCDating") Sometimes you need to know the state of economics in just a period of time. Using Window, you can obtain a new BCDating object limited to the time period mentioned. See examples.
window-methods

Author(s)

Majid Einian, <m.einian@mbri.ac.ir>, Monetary and Banking Research Institute, Central Bank of Islamic Republic of Iran

Examples

```r
library(BCDating)
data(MBRI.Iran.Dating)
MBRI.Iran.Dating
window(MBRI.Iran.Dating,start=c(1368,2),end=c(1376,1)) # 5th and 6th Gov's of IRI
```
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