Package 'BCDating'

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Type Package

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.

License GPL-2

Depends methods

NeedsCompilation no

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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

```
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)
```

avgts *TimeSeries averages over cycle phases.*

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)

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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)
```

BBQ *Harding-Pagan (Quarterly Bry-Boschan) Business Cycle Dating Procedure*

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>,
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Franck Arnaud ,
National Institute of Statistics and Economic Studies (INSEE), France

References

Harding, D. and Pagan A. 2002 "Dissecting the Cycle: A Methodological Investigation." *Journal of Monetary Economics* **49** (2), 365–381. http://www.sciencedirect.com/science/article/pii/S0304393201001088.

Examples

```
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 is 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

`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 ,
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References

Franck Arnaud's R package datation

`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

Einian, M. and M. Barakchian (2014), Measuring and Dating Business Cycles of the Economy of Iran, *Journal of Monetary & Banking Research*, 7(20), Summer 2014, pp. 161-194. (in Persian)

`Iran.non.Oil.GDP.Quarterly.Growth`

Quartely Grwoth of non-Oil GDP of Iran.

Description

Quartely Grwoth of non-Oil GDP of Iran. (after x12)

Usage

```
Iran.non.Oil.GDP.Quartely.Grwoth
```

Format

ts Quarterly Time Series

Source

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

References

Einian, M. and M. Barakchian (2014), Measuring and Dating Business Cycles of the Economy of Iran, *Journal of Monetary & Banking Research*, 7(20), Summer 2014, pp. 161-194. (in Persian)

`MBRI.Iran.Dating` *Dating of Business Cycles of Iran by MBRI*

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

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

Format

BCDating Object

Source

Einian, M. and M. Barakchian (2014)

References

Einian, M. and M. Barakchian (2014), Measuring and Dating Business Cycles of the Economy of Iran, *Journal of Monetary & Banking Research*, 7(20), Summer 2014, pp. 161-194. (in Persian)

Examples

```
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 serires in case y's class is mts) on a BCDating.

`signature(x = "ts", y = "BCDating")` Plot a Time-Series, (or multiple time serires 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)

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Franck Arnaud ,
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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))
```

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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)

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Franck Arnaud

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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.

Author(s)

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Examples

```
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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