

Package ‘iClick’

October 13, 2022

Type Package

Title A Button-Based GUI for Financial and Economic Data Analysis

Version 1.5

Date 2018-11-22

Author Ho Tsung-wu

Maintainer Ho Tsung-wu <tsungwu@ntnu.edu.tw>

Description A GUI designed to support the analysis of financial-economic time series data.

License GPL (>= 2)

LazyData TRUE

LazyLoad yes

Depends R (>= 2.10),lattice,rugarch,tcltk,sandwich,xts

Imports boot, car, coefplot, fBasics, forecast, grid, lmtest, lubridate, openair, papeR, timeDate, timeSeries, zoo

NeedsCompilation no

Repository CRAN

Date/Publication 2018-11-22 12:00:18 UTC

R topics documented:

iClick-package	2
boxPlotX	2
calendarHeat	3
cumulatedPlotX	4
cutAndStack	5
drawdownPlotX	6
drawupPlotX	7
drawups	8
FFplusMOM	8
IBM	9
iClick.ARIMA	10

iClick.GARCH	11
iClick.lm	13
iClick.VisAssetPrice	14
iClick.VisOneReturns	15
qqnormPlotX	16
returnsDaily24	17
seriesPlotX	18
VIF_no	19
world20	19

Index	21
--------------	-----------

iClick-package	<i>A Button-based GUI for Financial and Economic Data Analysis</i>
----------------	--

Description

A Output GUI designed to simplify the use of R packages and functions by clicking.

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

Maintainer: Ho Tsung-wu <tsungwu@ntnu.edu.tw>

boxPlotX	<i>Box-Whisker plot.</i>
----------	--------------------------

Description

This function generates plot by iClick.VisOneReturns.

Usage

```
boxPlotX(X, col = "indianred2", title = TRUE)
```

Arguments

X	A timeSeries object, single time series returns.
col	String for color.
title	Whether to generate title of graph.

Details

This function is an internal function of iClick GUI, which is executed on iClick.VisOneReturns GUI.

Value

Plot a graph

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

See Also

Functions in fBasics.

calendarHeat

Calendar Heapmap Plot

Description

This function generates calendar heatmap plot up to six year, due to visibility.

Usage

```
calendarHeat(values, ncolors = 99, color = "r2b", date.form = "%Y-%m-%d")
```

Arguments

values	Daily data of price or others.
ncolors	Number of color for heatmap.
color	Color plate selected, selection includes c("r2b", "r2g", "w2b").
date.form	Default date form.

Details

This function is within the iClick GUI, is executed within iClick.VisAssetPrice().

Value

Plot

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

`cumulatedPlotX` *Cumulative returns plot.*

Description

This function generates plot by `iClick.VisOneReturns()`.

Usage

```
cumulatedPlotX(x, index = 100, labels = TRUE, type = "l",  
col = "indianred2", ylab = "Values", title = TRUE,  
grid = TRUE, box = TRUE, rug = TRUE)
```

Arguments

<code>x</code>	A timeSeries object, single time series returns.
<code>index</code>	Returns index.
<code>labels</code>	Whether to generate label for the graph.
<code>type</code>	Type of graph.
<code>col</code>	Options for color.
<code>ylab</code>	String label for Y axis.
<code>title</code>	Whether to generate title for the graph.
<code>grid</code>	Whether to use grid in plot.
<code>box</code>	Whether to put the plot into a box.
<code>rug</code>	Whether to add rug.

Details

This function is an internal function of iClick GUI, which is executed on `iClick.VisOneReturns` GUI.

Value

Plot

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

cutAndStack	<i>Cut and Stack Plotting Function</i>
-------------	--

Description

This function calls cut() to cut timeseries into several equal periods and plots over time.

Usage

```
cutAndStack(x, number, overlap = 0.1, type = "l", xlab = "Time",  
ylab = deparse(substitute(x)))
```

Arguments

x	A timeSeries object, single time series price.
number	Number of equal cut.
overlap	Percentage of overlapping across cuts.
type	Type of line.
xlab	Label of X axis.
ylab	Label of Y axis.

Details

This function is within the iClick GUI, is executed within iClick.VisAssetprice().

Value

Plot

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

`drawdownPlotX`*Drawup Returns Plots*

Description

This function is within the iClick GUI, is executed within `iClick.VisOneReturns(dat)`, the data frame `dat` has two columns, the first column is date index and the second one is numeric time series data.

Usage

```
drawdownPlotX(x, labels = TRUE, type = "l", col = "darkgreen",
  title = TRUE, ylab = "Down returns", grid = TRUE, box = TRUE,
  rug = TRUE)
```

Arguments

<code>x</code>	A timeSeries object, single time series returns.
<code>labels</code>	Whether to generate label for the graph.
<code>type</code>	Type of line.
<code>col</code>	Options for color.
<code>title</code>	Whether to generate title for the graph.
<code>ylab</code>	String for Y axis.
<code>grid</code>	Whether to use grid in plot.
<code>box</code>	Whether to put the plot into a box.
<code>rug</code>	Whether to add rug.

Details

This function is an internal function of iClick GUI, which is executed on `iClick.VisOneReturns` GUI.

Value

Plot

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

See Also

Functions in `fBasics`.

`drawupPlotX`*Drawup Returns Plots*

Description

This function is within the iClick GUI, is executed within `iClick.VisOneReturns(dat)`, the data frame `dat` has two columns, the first column is date index and the second one is numeric time series data.

Usage

```
drawupPlotX(x, labels = TRUE, type = "l", col = "indianred2",
  title = TRUE, ylab = "Up Returns", grid = TRUE, box = TRUE,
  rug = TRUE)
```

Arguments

<code>x</code>	A timeSeries object, single time series returns.
<code>labels</code>	Whether to generate label for the graph.
<code>type</code>	Type of line.
<code>col</code>	Options for color.
<code>title</code>	Whether to generate title for the graph.
<code>ylab</code>	String for Y axis.
<code>grid</code>	Whether to use grid in plot.
<code>box</code>	Whether to put the plot into a box.
<code>rug</code>	Whether to add rug.

Details

This function is an internal function of iClick GUI, which is executed on `iClick.VisOneReturns` GUI.

Value

Plot

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

See Also

Functions in `fBasic` and `fAssets`.

drawups

Calculate Drawup Returns for Drawup Plot

Description

This function calculates drawup returns for plotting.

Usage

drawups(x)

Arguments

x A timeSeries object, single time series returns.

Details

This function is an internal function for drawplot of iClick GUI, which is executed on iClick.VisOneReturns GUI.

Value

Returns of draw up periods.

Author(s)

Ho Tsung-wu <tsungwu@mail.shu.edu.tw>

FFplusMOM

Data of Fama-French beta of 811 listed companies of SSEC

Description

Average data of 811 listed companies of SSEC, 2001/1/03~2012

Usage

data("FFplusMOM")

Format

A data frame with 811 observations on the following 4 variables.

company company code

RET company-specific average returns

MK_BETA CAPM factor beta

HML_BETA High-Minus-Low factor beta

SMB_BETA Small-Minus-Big factor beta

MOM_BETA Momentum factor beta

Details

Daily stock returns of 24 world national markets.

Source

Yahoo finance.

Examples

```
data(FFplusMOM)
```

IBM

Daily Price Data of IBM

Description

Daily price data of IBM, 2007/4/24~2017/4/21

Usage

```
data("IBM")
```

Format

A xts object with 2518 observations on the following 5 variables.

Open A numeric vector, open price

High A numeric vector, maximum price

Low A numeric vector, minimum price

Close A numeric vector, close price

Volume A numeric vector, trading volume

Details

Daily stock price data of IBM.

Source

Yahoo finance.

iClick.ARIMA
iClick GUI for ARIMA

Description

This GUI estimates ARIMA both with automatic lag selection and fixed lag length. The GUI is only a GUI, but also a output format.

Usage

```
iClick.ARIMA(dat, AR = 1, MA = 1, n.ahead = 24, ic = "aic")
```

Arguments

<code>dat</code>	Time series object, xts.
<code>AR</code>	Pre-specified fixed AR order.
<code>MA</code>	Pre-specified fixed MA order.
<code>n.ahead</code>	Periods of out-of-sample forecast.
<code>ic</code>	Information criteria for lag selection, <code>ic=c("aicc", "aic", "bic")</code> . See <code>auto.arima()</code> of package <code>forecast</code> .

Details

This GUI fits two ARMA, fixed orders and automatically fitted orders, and returns a two-part GUI with output on it. The outputs can be saved as .RData file for later use, the last row is the save button.

The saved filename is automatically generated by selections and results; for example, `.aicOrderARIMA_102.RData` represents the automatically fits ARIMA(p,d,q) orders are ARIMA(1,0,2) by AIC.

Using `load(".aicOrderARIMA_102.RData")` to retrieve the file and `ls()` to list objects, and use `names()` to show details of objects.

The input returns data must be in percentage form; namely, `dlog()*100`

Value

Fitted ARMA regression output.

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

See Also

arima() and auto.arima() of package forecast.

Examples

```
##External data
data("world20")
y=na.omit(diff(log(world20[,1])))

## Simulation data
#dat=rnorm(200,5,1)
#y=ts(dat, start = c(1970, 1), frequency = 12)

iClick.ARIMA(y)

#More
iClick.ARIMA(y,AR = 2, MA = 2, n.ahead = 12, ic = "bic")
```

iClick.GARCH

iClick Output GUI for Univariate GARCH Models

Description

This GUI makes GARCH estimation of comparison easy. With a pre-selected GARCH type, it automatically fits eight probability distributions and conducts all diagnostic tests with a Click.

Usage

```
iClick.GARCH(dat, meanEQ = meanEQ, garchEQ = garchEQ, n.ahead = 15)
```

Arguments

dat	Time series object, xts.
meanEQ	Specification of mean equation.
garchEQ	Specification of variance equation.
n.ahead	Number of out-of-sample forecasting period.

Details

This GUI fits 8 distributions for univariate GARCH with pre-selected GARCH types, and returns a 54-button GUI output. The outputs can be individually saved as .RData file for later use, the last row is the save button. The saved filename is automatically generated once clicked, in addition, corresponding .csv files will be generated also.

The 54-button GUI is divided into 9 panes, and the last pane collects coefficient outputs and diagnostic tests together, which aims to make estimation comparison easy.

Value

Fitted GARCH regression output.

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

See Also

library(rugarch)

Examples

```
##==External data
data("world20")
y=na.omit(diff(log(world20[,1])))

##== Simulation data
#dat=rnorm(200,5,1)
#y=ts(dat, start = c(1970, 1), frequency = 12)

meanEQ=list(AR=1,MA=0,Exo=NULL, autoFitArma=FALSE,arfimaDiff=FALSE,archM=FALSE)
# If there are external regressors X, put them as Exo=X
# autoFitArma=TRUE, If you want to fit arma automatically.
# arfimaDiff=TRUE,to take ARFIMA difference
# archM=TRUE, to estimate GARCH-in-mean

garchEQ=list(Type="sGARCH",P=1,Q=1, exo=NULL)
# Type: "sGARCH","eGARCH","gjrGARCH","iGARCH","apGARCH"
# please check rugarch for details.
# P is the ARCH order
# Q is the GARCH order

#iClick.GARCH(y,meanEQ, garchEQ, n.ahead=15)
# This computation takes more than 6 seconds, hence I added a # to block it.
```

iClick.lm

iClick GUI for linear model

Description

This GUI estimates ARIMA both with automatic lag selection and fixed lag length. The GUI is only only a GUI, but also a output format.

Usage

```
iClick.lm(dep, indep, data, Formula=NULL, bootrep=99)
```

Arguments

data	A R data object for lm()
dep	scalar, the number of column as dependent variable
indep	scalar, the numbers of column as independent variables
Formula	A formula for lm, default is NULL, if specified, dep and indep should leave empty. See example below
bootrep	Bootstrap replications, default is 99

Details

This GUI fits equaiton into lm regression.

Value

Fitted lm regression output.

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

See Also

lm()

Examples

```
data("FFplusMOM")
iClick.lm(dep=2, indep=c(3,5:6), data=FFplusMOM, bootrep=9)

#Eq=RET~(MK_BETA+HML_BETA+SMB_BETA)^2
#iClick.lm(Formula=Eq, data=FFplusMOM, bootrep=9)
```

iClick.VisAssetPrice *Visualize Daily Asset Price*

Description

This GUI conducts plots of daily asset price, including calendar heatmap and many plots which are not easy to use for new users.

Usage

```
iClick.VisAssetPrice(dat, color4 = "r2b", color5 = "jet")
```

Arguments

dat	Time series object,xts.
color4	Color choice for annual calendar heatmap, the default is "r2b".
color5	Color choice for 6-year calendar heatmap, the default is "jet".

Details

This GUI is designed for financial time series, mainly daily stock price. Other time series data works also, as long as it has a date column. We call function `calendarPlot()` from package "openair", and modified the function `calendarHeat()` to fit daily price, which is limited to 11 years.

Value

Output GUI

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

Examples

```
#data("IBM")
#assetPrice=IBM[,1]
#iClick.VisAssetPrice(assetPrice)
```

`iClick.VisOneReturns` *Visualize Asset Returns*

Description

This GUI conducts plots of daily asset returns, including ACF, PACF, drawdowns, and Talyor effects.

Usage

```
iClick.VisOneReturns(dat)
```

Arguments

`dat` Time series object,xts.

Details

This GUI is designed for financial time series, maily daily stock returns. Other time series data works also, as long as it has a date column.

Value

Output GUI

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

Examples

```
data("world20")
y=na.omit(diff(log(world20[,1])))

## Simulation data
#dat=rnorm(200,5,1)
#y=ts(dat, start = c(1970, 1), frequency = 12)
iClick.VisOneReturns(y)
```

`qqnormPlotX`*QQ Plot*

Description

This function is within the iClick GUI, is executed within `iClick.VisOneReturns(dat)`, the data frame `dat` has two columns, the first column is date index and the second one is numeric time series data.

Usage

```
qqnormPlotX(X, labels = TRUE, col = "indianred2", pch = 19,  
title = TRUE, mtext = TRUE, grid = FALSE, rug = TRUE,  
scale = TRUE)
```

Arguments

<code>X</code>	A timeSeries object, single time series returns.
<code>labels</code>	Whether to generate label for the graph.
<code>col</code>	String for color.
<code>pch</code>	Line options.
<code>title</code>	Whether to generate title for the graph.
<code>mtext</code>	Whether to generate main text for the graph.
<code>grid</code>	Whether to use grid in plot.
<code>rug</code>	Whether to add rug.
<code>scale</code>	Whether to scale the data.

Details

This function is an internal function of iClick GUI, which is executed on `iClick.VisOneReturns` GUI.

Value

Plot

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

See Also

Functions in `fBasics`.

returnsDaily24	<i>Daily Returns Data of 24 Markets</i>
----------------	---

Description

Daily returns data of 24 world national market index, 2001/1/03~2013/9/24

Usage

```
data("returnsDaily24")
```

Format

A data frame with 3320 observations on the following 24 variables.

Dates Time string

AEX a numeric vector of national market

AORD a numeric vector of national market

ATX a numeric vector of national market

BFX a numeric vector of national market

BVSP a numeric vector of national market

FCHI a numeric vector of national market

FTSE a numeric vector of national market

FTSEMIB.MI a numeric vector of national market

GD.AT a numeric vector of national market

GDAXI a numeric vector of national market

GSPC a numeric vector of national market

GSPTSE a numeric vector of national market

HSI a numeric vector of national market

JKSE a numeric vector of national market

KLSE a numeric vector of national market

KS11 a numeric vector of national market

MERV a numeric vector of national market

MXX a numeric vector of national market

N225 a numeric vector of national market

OMX a numeric vector of national market

SSEC a numeric vector of national market

SSMI a numeric vector of national market

STI a numeric vector of national market

TWII a numeric vector of national market

Details

Daily stock returns of 24 world national markets.

Source

Yahoo finance.

seriesPlotX

Plot Time Series Data

Description

This function is within the iClick GUI, is executed within `iClick.VisOneReturns(dat)`, the data frame `dat` has two columns, the first column is date index and the second one is numeric time series data.

Usage

```
seriesPlotX(x, labels=TRUE, type="l", col="indianred2",  
ylab="Value", title=TRUE, grid=TRUE, box=TRUE, rug=TRUE)
```

Arguments

<code>x</code>	A timeSeries object, single time series returns.
<code>labels</code>	Whether to generate label for the graph.
<code>type</code>	Type of graph.
<code>col</code>	Options for color.
<code>ylab</code>	String label for Y axis.
<code>title</code>	Whether to generate title for the graph.
<code>grid</code>	Whether to generate grid for the graph.
<code>box</code>	Whether to put the plot into a box.
<code>rug</code>	Whether to add rug.

Details

This function is an internal function of iClick GUI, which is executed on `iClick.VisOneReturns GUI`.

Value

Plot

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

See Also

fBasics

VIF_no	<i>VIF test for multicollinearity</i>
--------	---------------------------------------

Description

This function tests for multicollinearity.

Usage

```
VIF_no(obj)
```

Arguments

obj A lm object

Details

This function is an internal function of iClick GUI, which is executed on iClick.lm GUI.

Value

Test statistic

Author(s)

Ho Tsung-wu <tsungwu@ntnu.edu.tw>, College of Management, National Taiwan Normal University

world20	<i>Close Price Data of twenty national market indices</i>
---------	---

Description

Daily close price data of world20, 2007/4/24~2017/4/21

Usage

```
data("world20")
```

Format

A xts object with 2518 observations of twenty national market indices.

Details

A xts object with 2518 observations of twenty national market indices.

Source

Yahoo finance.

Index

boxPlotX, [2](#)

calendarHeat, [3](#)

cumulatedPlotX, [4](#)

cutAndStack, [5](#)

drawdownPlotX, [6](#)

drawupPlotX, [7](#)

drawups, [8](#)

FFplusMOM, [8](#)

IBM, [9](#)

iClick (iClick-package), [2](#)

iClick-package, [2](#)

iClick.ARIMA, [10](#)

iClick.GARCH, [11](#)

iClick.lm, [13](#)

iClick.VisAssetPrice, [14](#)

iClick.VisOneReturns, [15](#)

qqnormPlotX, [16](#)

returnsDaily24, [17](#)

seriesPlotX, [18](#)

VIF_no, [19](#)

world20, [19](#)