Package ‘fImport’

February 19, 2015

Version 3000.82

Revision 5455

Date 2013-03-15

Title Rmetrics - Economic and Financial Data Import

Author Diethelm Wuertz and many others

Depends R (>= 2.13.0), methods, timeDate, timeSeries

Suggests RUnit

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Description Environment for teaching ``Financial Engineering and Computational Finance''

Note Several parts are still preliminary and may be changed in the future. this typically includes function and argument names, as well as defaults for arguments and return values.

LazyData yes

License GPL (>= 2)

URL http://www.rmetrics.org

NeedsCompilation no

Repository CRAN

Date/Publication 2013-03-15 14:54:11

R topics documented:

`fImport-package` *Import Data Package*

Description

Package of utility functions to download and manage data sets from the Internet or from other sources.

Details

Package:	fImport
Type:	Package
Date:	2008, 2009, 2010
License:	GPL Version 2 or later
Copyright:	(c) 1999-2008 Diethelm Wuertz and Rmetrics Foundation
URL:	`http://www.rmetrics.org`

The package contains:

1) Three example import funcions for Yahoo, Oanda, and the Federal Reserve.

2) Several utility functions to read and write data, including functions which allow system calls to the `Links`, `Lynx`, and `W3M` text browser, and a function to read `xls` Excel files.

3) Several csv files with provider listings.

Overview on Time Series Data:

The package makes functions available to download financial market data from the internet. Functions are available for the follwing web sites:

1. Data from research.stlouisfed.org
2. Data from www.oanda.com
3. Data from chart.yahoo.com

There are two kinds of functions available, the first kind is called `*Series` which downloads a `"timeSeries"` object from a web site wher the star `*` is a placeholder for the web site (fred, oanda, and yahoo), and the second kind is called `*Import` which downloads an S4 object of class `"fWEBDATA"` wit a `@Data` slot which keeps the `"timeSeries"` object and further slots which keep additional download information.

We recommend the first kind of functions for easy download of economic and financial time series, whereas we recommend to use the second kind of functions when additional information is required for example for the storage of the data in a data base management system.

IMPORTANT NOTE: The download from the web site www.forecasts.org has been withdrawn since the time series are no longer updated. Note, all the series offered by the "forecasts.org" web site are also available from the FRED St. Louis database.

Downloading 'timeSeries' Objects:

The following functions

1. fredSeries
2. oandaSeries
3. yahooSeries

allow for an easy download of economic and financial time series data as objects of class `"timeSeries"`.

Note, with version 280.73 major changes were made in the argument list of the downloading functions. We apologize for any inconveniences caused by these changes. The reason was that now all functions have the same arguments which makes their usage much easier. For details we refer to the help pages of the functions mentioned above.

If you like to keep additional download information, use the functions

1. fredImport
2. oandaImport
3. yahooImport

which return objects of class `"fWEBDATA"`.

Fomer Yahoo Utilities:

The function `yahooKeystats` allows to download key statistics from Yahoo's web site.

The function `yahooBriefings` allows to download a briefing from Yahoo's web site.

Note: The Yahoo utilities `yahooKeystats` and `yahooBriefings` are (as of March 2012) no longer supported.

License:

This Rmetrics package is written for educational usage teaching "Computational Finance and Financial Engineering" and licensed under GPL.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

`class-fWEBDATA` *Class "fWEBDATA"*

Description

The class fWEBDATA represents a download from the internet.

Objects from the Class

Objects can be created by calls of the import or series functions.

Slots

`call`: Object of class `"call"`: the call of the applied function.

`data`: Object of class `"data.frame"`: the data as downloaded formatted as a data.frame.

`param`: Object of class `"character"`: a character vector whose elements contain the values of selected parameters of the argument list.

`title`: Object of class `"character"`: a character string with the name of the download. This can be overwritten specifying a user defined input argument.

`description`: Object of class `" character"`: a character string with an optional user defined description. By default just the current date and user when the test was applied will be returned.

Methods

show `signature(object = "fWEBDATA")`: prints an object of class 'fWEBDATA'.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

`import-fred` *Import Market Data from the Fred*

Description

Imports financial time series data from research.stlouisfed.org.

Usage

```
fredSeries(symbols, from = NULL, to = Sys.timeDate(),
    nDaysBack = 366, ...)

fredImport(query, file = "tempfile", source = NULL, frequency = "daily",
    from = NULL, to = Sys.timeDate(), nDaysBack = NULL,
    save = FALSE, sep = ";", try = TRUE)
```

Arguments

`file`	a character string with filename, usually having extension ".csv", where to save the downloaded data.
`frequency`	a character string, one of "auto", "quarterly", "monthly", or "daily", defining the frequency of the data records. Note, the import function tries autodetect the frequency of the time series to be dowwnloaded. This may fail, in such case specify the frequency explicitely.
`from`	the date from when to extract the time series.
`nDaysBack`	the number of days back.
`query`	a character string, denoting the location of the data at the web site.
`save`	a logical value, if set to TRUE the downloaded data file will be stored under the path and file name specified by the string `file`. By default FALSE.
`sep`	a charcter value specifying the column separator.
`source`	a character string setting the URL of the source. If `NULL`, then the URL will be set automatically to its default value.
`symbols`	a character string with the symbols to be downloaded.
`to`	the end date of the data download, by default the current date.
`try`	a logical value, if set to TRUE the Internet access will be checked.
`...`	optional arguments to be passed.

Value

The function `fredImport` returns an S4 object of class `fWEBDATA` with the following slots:

`@call`	the function call.
`@data`	the data as downloaded formatted as a data.frame.
`@param`	a character vector whose elements contain the values of selected parameters of the argument list.
`@title`	a character string with the name of the download. This can be overwritten specifying a user defined input argument.
`@description`	a character string with an optional user defined description. By default just the current date when the test was applied will be returned.

The function `fredSeries` returns an S4 object of class `timeSeries` or alternatively an object specified by the function argument `returnClass`.

Note

Internet Download Functions:

IMPORTANT NOTE: If the service provider changes the data file format it may become necessary to modify and update the functions.

Author(s)

Diethelm Wuertz for the Rmetrics R-port.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

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import-oanda *Import FX Market Data from OANDA*

Description

Imports FX market data from www.oanda.com.

Usage

```
oandaSeries(symbols, from = NULL, to = Sys.timeDate(),
    nDaysBack = 366, ...)

oandaImport(query, file = "tempfile", source = NULL, frequency = "daily",
    from = NULL, to = Sys.timeDate(), nDaysBack = 366,
    save = FALSE, sep = ";", try = TRUE)
```

Arguments

`file`	a character string with filename, usually having extension ".csv", where to save the downloaded data.
`frequency`	a character string, one of "auto", "quarterly", "monthly", or "daily", defining the frequency of the data records. Note, the import function tries autodetect the frequency of the time series to be dowwnloaded. This may fail, in such case specify the frequency explicitely.
`from`	the date from when to extract the time series.
`nDaysBack`	the number of days back.
`query`	a character string, denoting the location of the data at the web site.
`save`	a logical value, if set to TRUE the downloaded data file will be stored under the path and file name specified by the string `file`. By default FALSE.
`sep`	a charcter value specifying the column separator.
`source`	a character string setting the URL of the source. If `NULL`, then the URL will be set automatically to its default value.
`symbols`	a character string with the symbols to be downloaded.
`to`	the end date of the data download, by default the current date.
`try`	a logical value, if set to TRUE the Internet access will be checked.
`...`	optional arguments to be passed.

Value

The function `fredImport` returns an S4 object of class `fWEBDATA` with the following slots:

`@call`	the function call.
`@data`	the data as downloaded formatted as a data.frame.
`@param`	a character vector whose elements contain the values of selected parameters of the argument list.
`@title`	a character string with the name of the download. This can be overwritten specifying a user defined input argument.
`@description`	a character string with an optional user defined description. By default just the current date when the test was applied will be returned.

The function `fredSeries` returns an S4 object of class `timeSeries` or alternatively an object specified by the function argument `returnClass`.

Note

Internet Download Functions:

IMPORTANT NOTE: If the service provider changes the data file format it may become necessary to modify and update the functions.

Author(s)

Diethelm Wuertz for the Rmetrics R-port.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

`import-yahoo` *Import Market Data from Yahoo*

Description

Imports financial time series data from chart.yahoo.com.

Usage

```
yahooSeries(symbols, from = NULL, to = Sys.timeDate(),
    nDaysBack = 366, ...)

yahooImport(query, file = "tempfile", source = NULL,
    frequency = c("daily", "weekly", "monthly"),
    from = NULL, to = Sys.timeDate(), nDaysBack = 366,
    save = FALSE, sep = ";", try = TRUE)
```

Arguments

`file`	a character string with filename, usually having extension ".csv", where to save the downloaded data.
`frequency`	a character string, one of "auto", "quarterly", "monthly", or "daily", defining the frequency of the data records. Note, the import function tries autodetect the frequency of the time series to be dowwnloaded. This may fail, in such case specify the frequency explicitely.
`from`	the date from when to extract the time series.
`nDaysBack`	the number of days back.
`query`	a character string, denoting the location of the data at the web site.
`save`	a logical value, if set to TRUE the downloaded data file will be stored under the path and file name specified by the string `file`. By default FALSE.
`sep`	a charcter value specifying the column separator.
`source`	a character string setting the URL of the source. If `NULL`, then the URL will be set automatically to its default value.
`symbols`	a character string with the symbols to be downloaded.
`to`	the end date of the data download, by default the current date.
`try`	a logical value, if set to TRUE the Internet access will be checked.
`...`	optional arguments to be passed.

Details

Import data from chart.yahoo.com:

The query string is given as

`s=SYMBOL&a=DD&b=MM&c=CCYY&g=d&q=q&z=SYMBOL&x=.csv`

where `SYMBOL` has to replaced by the symbol name of the instrument, and `DD`, `MM`, and `CCYY` by the day, month-1 and century/year when the time series should start.

Here are some examples of symbols:

`[query]` Description:

`^DJI`	Dow Jones 30 Industrial Averages
`^NYA`	New York Stock Exchange Composite
`^NDX`	Nasdaq 100 Index
`^IXIC`	Nasdaq Composite Index
`^TYX`	US 30Y Treasury Bond Index
`IBM`	BM DJIA Stock
`KO`	Coca-Cola DJIA Stock

The meaning of the tokens in the query string are the following:

Token	Description
`s`	Selected Ticker-Symbol
`a`	First Quote starts with Month (mm)
`b`	First Quote starts with Day (dd)
`c`	First Quote starts with Year (ccyy)
`d`	Last Quote ends with Month (mm)
`e`	Last Quote ends with Day (dd)
`f`	Last Quote ends with Year (ccyy)
`z`	Selected Ticker-Symbol

Value

The function `yahooImport` returns an S4 object of class `fWEBDATA` with the following slots:

`@call` the function call.

`@data` the data as downloaded formatted as a data.frame.

`@param` a character vector whose elements contain the values of selected parameters of the argument list.

`@title` a character string with the name of the download. This can be overwritten specifying a user defined input argument.

`@description` a character string with an optional user defined description. By default just the current date when the test was applied will be returned.

The function `yahooSeries` returns an S4 object of class `timeSeries` or alternatively an object specified by the function argument `returnClass`.

The function `keystatsImport` returns a data frame with key statistics downloaded from yahoo's web site.

Note

Internet Download Functions:

IMPORTANT NOTE: If the service provider changes the data file format it may become necessary to modify and update the functions.

Author(s)

Diethelm Wuertz for the Rmetrics R-port.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

`provider-Listings` *Provider Listing of symbols and descriptions*

Description

CSV files with provider listings of symbols, descriptions ands related information

Format

All files are in CSV Excel spreadsheet format. The delimiter is a semicolon.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

`read-download` *Download Utilities*

Description

Twp helpful utilities to read downloads.\

Usage

```
composeURL(..., prefix="http://")
indexGrep(pattern, x, ...)
```

Arguments

`...`	[composeURL] character strings from which the URL will be composed. [indexGrep] optional arguments to be passed to the function `grep`.
`prefix`	a character string specifying the prefix of the URL.
`pattern`	a character string containing a regular expression to be matched in the given character vector.
`x`	a character vector where matches are sought.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

`read-lines` *Read from a text file line by line*

Description

Reads from a text file line by line. Wrapper to readLines() function.

Usage

```
read.lines(con=stdin(), n=-1, ok=TRUE, warn=FALSE, encoding="unknown")
```

Arguments

`con`	a connection object or a character string.
`n`	an integer, the (maximal) number of lines to read. Negative values indicate that one should read up to the end of input on the connection.
`ok`	a logical, is it OK to reach the end of the connection before n > 0 lines are read? If not, an error will be generated.
`warn`	a logical, warn if a text file is missing a final EOL. The default is FALSE, note different from function `readLines`.
`encoding`	a character string, the encoding to be assumed for input strings.

Value

the downloaded text. Same output as readLines() function.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

read-links *Links Browser interface*

Description

Uses the Links Text Browser to read a web page.

Usage

```
read.links(url, intern = TRUE, bin = NULL, pipe = FALSE, ...)
```

Arguments

`url`	a character string specifying the URL of the web page.
`intern`	a logical which indicates whether to make the output of the command an R object.
`bin`	a string with the path of your lynx binary or NULL if lynx binary is available in the operating system path.
`pipe`	a logical which indicates whether the result should be returned as a `pipe()` commmand.
`...`	optional arguments passed to links binary.

Value

the downloaded text.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

read-lynx *Lynx Browser interface*

Description

Uses the Lynx Browser to read a web page.

Usage

```
read.lynx(url, intern = TRUE, bin = NULL, pipe = FALSE, ...)
```

Arguments

`url` a character string specifying the URL of the web page.

`intern` a logical which indicates whether to make the output of the command an R object.

`bin` a string with the path of your lynx binary or NULL if lynx binary is available in the operating system path.

`pipe` a logical which indicates whether the result should be returned as a `pipe()` commmand.

`...` optional arguments passed to lynx binary. For example `accept_all_cookies = TRUE` or `cookie_file="~/.lynx_cookies"`. For a list of options, see the lynx manual page.

Value

the downloaded text.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

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read-split *Splitting downloaded data sets*

Description

Two helpful data set and charvec splitting utilities.

Usage

```
dataSplit(x, split=" ", col=-1)
charvecSplit(x, split=" ", col=1, format="%F")
```

Arguments

`x` character vector to be splitted.

`split` the split character, by default a blank.

`col` an integer value or vector, the columns to be selected.

`format` the date format of the character vector, by default the ISO-8601 date format.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

read-w3m *w3m Browser interface*

Description

Uses the w3m Browser to read a web page.

Usage

```
read.w3m(url, intern = TRUE, bin = NULL, pipe = FALSE, ...)
```

Arguments

`url`	a character string specifying the URL of the web page.
`intern`	a logical which indicates whether to make the output of the command an R object.
`bin`	a string with the path of your w3m binary or NULL if w3m binary is available in the operating system path.
`pipe`	a logical which indicates whether the result should be returned as a `pipe()` commmand.
`...`	optional arguments passed to w3m binary. For a list of options, see the w3m manual page.

Value

the downloaded text.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

read-xls *Read from an xls file*

Description

Reads a sheet from an xls file.

Usage

```
read.xls(url, sheet=1, lines=-1, verbose=FALSE, encoding="unknown")
```

Arguments

`url`	a character string specifying the URL of the web page.
`sheet`	an integer denoting which sheet should be extracted, by default the first.
`lines`	a negative integer with the lines to be skipped, by default the first.
`verbose`	a logical decides about verbose mode, by default FALSE.
`encoding`	a character string with the type of encoding, by defaul `"unknown"`.

Value

the downloaded text.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

`show-methods` *WEBDATA Download Show Methods*

Description

Show methods for WEBDATA downloads.

Methods

object = "ANY" Generic function.

object = "fWEBDATA" Print function for objects of class `"fWEBDATA"`.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

utils-yahooBriefing *Import Briefings from Yahoo*

Description

Imports briefings from chart.yahoo.com.

Usage

```
yahooBriefing(query, file = "tempfile", source = NULL, save = FALSE, try = TRUE)
```

Arguments

`file`	a character string with filename, usually having extension ".csv", where to save the downloaded data.
`query`	a character string, denoting the location of the data at the web site.
`save`	a logical value, if set to TRUE the downloaded data file will be stored under the path and file name specified by the string `file`. By default FALSE.
`source`	a character string setting the URL of the source. If `NULL`, then the URL will be set automatically to its default value.
`try`	a logical value, if set to TRUE the Internet access will be checked.

Value

returns a data frame with briefings downloaded from yahoo's web site.

Author(s)

Diethelm Wuertz for the Rmetrics R-port.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis, (2010); *Financial Market Data for R/Rmetrics*, Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

utils-yahooKeystats *Import Key Statistics Data from Yahoo*

Description

Imports key statistics data from chart.yahoo.com.

Usage

```
yahooKeystats(query, file = "tempfile", source = NULL, save = FALSE, try = TRUE)
```

Arguments

`file`	a character string specifying a filename, usually having extension '".csv"', where to save the downloaded data.
`query`	a character string, denoting the location of the data at the web site.
`save`	a logical value, if set to TRUE the downloaded data file will be stored under the path and file name specified by the string `file`. By default FALSE.
`source`	a character string setting the URL of the source. If `NULL`, then the URL will be set automatically to its default value.
`try`	logical indicating if the internet access will be checked.

Value

returns a data frame (`data.frame`) with key statistics downloaded from yahoo's web site.

Author(s)

Diethelm Wuertz for the Rmetrics R-port.

References

Diethelm Wuertz, Yohan Chalabi, and Andrew Ellis (2010). *Financial Market Data for R/Rmetrics*; Rmetrics eBook, Rmetrics Association and Finance Online, Zurich, www.rmetrics.org.

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