

# Package ‘TSdbi’

July 2, 2014

**Version** 2013.9-1

**Title** TSdbi (Time Series Database Interface)

**Description** TSdbi provides a common interface to time series databases. The objective is to define a standard interface so users can retrieve time series data from various sources with a simple, common, set of commands, and so programs can be written to be portable with respect to the data source. The SQL implementations also provide a database table design, so users needing to set up a time series database have a reasonably complete way to do this easily. The interface provides for a variety of options with respect to the representation of time series in R. The interface, and the SQL implementations, also handle vintages of time series data (sometime called editions or realtime data). There is also a (not yet well tested) mechanism to handle multilingual data documentation. Comprehensive examples of all the TS\* packages is provided in the vignette Guide.pdf with the TSdata package.

**Depends** R (>= 2.8.0)

**Imports** methods, DBI, tframe (>= 2008.5-1)

**Suggests** zoo, tseries, tis, tplot, tframePlus

**BuildVignettes** true

**License** GPL-2

**Copyright** 2007-2011 Bank of Canada. 2012-2013 Paul Gilbert.

**Author** Paul Gilbert <pgilbert.ttv9z@ncf.ca>

**Maintainer** Paul Gilbert <pgilbert.ttv9z@ncf.ca>

**URL** <http://tsdbi.r-forge.r-project.org/>

**NeedsCompilation** no

**Repository** CRAN

**Date/Publication** 2013-09-29 18:08:40

## R topics documented:

TSdbi-package	2
TScheckdbi	3
TSconnect	4
TSdates	5
TSdescription	6
Tsexists	8
TSfinddb	9
TSget	10
TSput	11
TSsourceInfo	13
TSvintages	14

<b>Index</b>	<b>15</b>
--------------	-----------

---

TSdbi-package	<i>Time Series Data Base Interface</i>
---------------	--

---

### Description

TSdbi provides an common interface to time series databases. Several of these are databases available over the Internet. Others are packages that use the DBI package interface to SQL databases. For these a table structure is specified. TSdbi can also be used as an interface to Fame databases through TSfame.

### Details

```

Package:    TSdbi
Depends:    R (>= 2.5.0), methods, tframe (>= 2008.5-1)
Imports:    methods, DBI
Suggests:   zoo, tseries
License:    GPL Version 2.
URL:        http://tsdbi.r-forge.r-project.org

```

The main functions are:

```

TSconnect    Connect to a database.
TSget        Extract a series from a database.
TSput        Write a series to the database.
TSdates      Check the availability of a series.
TSdescription Extract the long description of a series.
TSdoc        Extract the documentation for a series.

```

Use of this package requires one of the interface packages (e. g. **TSSQLite**, **TSMYSQL**, **TSPostgreSQL**) An overview of how to use the package is available in the vignettes of the package **TSdata**.

Using **TSdbi** is very similar for the different database interfaces, but building vignettes requires working code so the vignettes are included in the various interface packages. For the same reason, most examples and demos must be included in the interface packages. Consult the documentation for the methods in a particular interface package for most examples.

Options can be set to simplify access to a commonly used database (see [TSput](#)).

**Author(s)**

Paul Gilbert <pgilbert.ttv9z@ncf.ca> Maintainer: Paul Gilbert <pgilbert.ttv9z@ncf.ca>

**See Also**

[TSconnect](#), [TSget](#), [TSput](#), [TSdates](#), [dbConnect](#), [TSdbiMethods](#), [TSdbiMethods](#), [TSdbiMethods](#),

---

TScheckdbi

*Check Connection*

---

**Description**

Check if time series database connection is ok.

**Usage**

```
TScheckdbi(con)
## S4 method for signature 'missing'
TScheckdbi(con=getOption("TSconnection"))
## S4 method for signature 'ANY'
TScheckdbi(con=getOption("TSconnection"))
```

**Arguments**

con                   A database connection.

**Details**

The function `TScheckdbi` checks if a connection to a server is a connection to a valid time series database.

**Value**

TRUE or FALSE.

**See Also**

[dbConnect](#), [TSdates](#), [TSget](#), [TSput](#)

TSconnect

*Connect to a Time Series Database***Description**

Return a connection to a time series database

**Usage**

```

TSconnect(drv, dbname, ...)
  ## S4 method for signature 'character,character'
TSconnect(drv, dbname, ...)
  ## S4 method for signature 'logicalId'
show(object)
  ## S4 method for signature 'TSdb'
show(object)
  ## S4 method for signature 'TSMeta'
show(object)
  ## S4 method for signature 'TSdb'
print(x, ...)

```

**Arguments**

drv	A database connection driver or character string.
dbname	The name of the database to which the connection should be established
x	A database connection as returned by TSconnect.
object	an object to display.
...	Additional arguments passed to other print methods.

**Details**

This function establishes a connection using a driver from one of the driver packages (e.g. **TSMYSQL** or **TSSQLite**). If `drv` is a character string (e.g. "MySQL") then the method attempts to get a driver using the character string.

"TSconnect" uses `dbConnect` but checks the database has expected tables and also establishes information about additional features that may be available (vintiges and/or panels).

Options can be set to simplify access to a commonly used database (see [TSput](#)).

**Value**

A database connection.

**See Also**

[TSdbi-package](#), [dbConnect](#), [TSget](#), [TSput](#), [TSdates](#)

---

 TSdates *Check Data Availability*


---

**Description**

Check the dates for which date is available.

**Usage**

```

TSdates(serIDs, con=getOption("TSconnection"),
        vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

## S4 method for signature 'character,missing'
TSdates(serIDs, con=getOption("TSconnection"),
        vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
## S4 method for signature 'character,ANY'
TSdates(serIDs, con=getOption("TSconnection"),
        vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

## S3 method for class 'TSdates'
start(x, ...)
## S3 method for class 'TSdates'
tfstart(x)
## S3 method for class 'TSdates'
end(x, ...)
## S3 method for class 'TSdates'
tfend(x)

```

**Arguments**

con	A database connection.
serIDs	identifiers for series on the database.
x	an object returned by TSdates.
vintage	character string indicating vintage of the series on the database (if supported by the database).
panel	character string indicating panel of the series on the database (if supported by the database).
...	arguments passed to other methods.

**Details**

TSdates returns information about the start and end of each series in serIDs. con is a database connection as returned by dbConnect. TSdates also provides simple way to query a regularly used database. The connection can be set in options using options(TSconnection=con) and then only the series identifiers need to be specified in calls to TSdates.

start, tfstart, end, and tfend extract start and end dates from the object returned by TSdates.

**Value**

depends.

**See Also**

[TSdbi-package](#), [TSdescription](#), [dbConnect](#), [TSget](#), [TSput](#), [tfstart](#), [tfend](#)

---

TSdescription

*Specific Methods for Documenting Data*

---

**Description**

See the generic function description.

**Usage**

```

    TSmeta(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,missing'
    TSmeta(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,ANY'
    TSmeta(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,missing'
    TSmeta(x, con, ...)

    TSmeta(x) <- value

    TSdescription(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,missing'
    TSdescription(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,ANY'
    TSdescription(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,missing'
    TSdescription(x, con, ...)
    ## S4 method for signature 'missing,ANY'
    TSdescription(x, con, serIDs, ...)
    ## S4 method for signature 'missing,missing'
    TSdescription(x, serIDs, ...)
    TSdescription(x) <- value

    TSdoc(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,missing'
    TSdoc(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'character,ANY'
    TSdoc(x, con=getOption("TSconnection"), ...)
    ## S4 method for signature 'ANY,missing'
    TSdoc(x, con, ...)
    ## S4 method for signature 'missing,ANY'

```

```

TSDoc(x, con, serIDs, ...)
  ## S4 method for signature 'missing,missing'
TSDoc(x, serIDs, ...)
  TSDoc(x) <- value

  TSLabel(x, con=getOption("TSconnection"), ...)
  ## S4 method for signature 'character,missing'
TSLabel(x, con=getOption("TSconnection"), ...)
  ## S4 method for signature 'character,ANY'
TSLabel(x, con=getOption("TSconnection"), ...)
  ## S4 method for signature 'ANY,missing'
TSLabel(x, con, ...)
  ## S4 method for signature 'missing,ANY'
TSLabel(x, con, serIDs, ...)
  ## S4 method for signature 'missing,missing'
TSLabel(x, serIDs, ...)
  TSLabel(x) <- value

  TSsource(x, con=getOption("TSconnection"), ...)
  ## S4 method for signature 'character,missing'
TSsource(x, con=getOption("TSconnection"), ...)
  ## S4 method for signature 'character,ANY'
TSsource(x, con=getOption("TSconnection"), ...)
  ## S4 method for signature 'ANY,missing'
TSsource(x, con, ...)
  ## S4 method for signature 'missing,ANY'
TSsource(x, con, serIDs, ...)
  ## S4 method for signature 'missing,missing'
TSsource(x, serIDs, ...)
  TSsource(x) <- value

  TSrefperiod(x)
  ## S4 method for signature 'default'
TSrefperiod(x)
  TSrefperiod(x) <- value

```

### Arguments

con	A database connection.
serIDs	identifiers for series on the database.
x	a time series data object or an identifier for a series on the database.
value	a character string (or vector of character strings).
...	arguments passed to other methods.

### Details

These functions return various information about the data series. Methods with con and serIDs (sometimes identifiers are passed as argument x) get data from the database. Others extract infor-

mation from the object.

Assignments assign an attribute to the object *x* with value. If *x* is a multivariate time series (matrix) then value should be a vector of length equal the number of series. The reference period for a time series indicates a special reference point (e.g. "Wednesday" for weekly data collected on Wednesday).

The extraction methods extract the attribute.

### Value

Depends. See details.

### See Also

[TSget](#), [TSput](#), [TSexists](#), [TSdates](#)

---

TSexists

*Check if Series Exist on a Database*

---

### Description

Return a logical value indicating if series exist on a database, including vintages.

### Usage

```
TSexists(serIDs, con=getOption("TSconnection"),
vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
## S4 method for signature 'default'
TSexists(
serIDs, con=getOption("TSconnection"),
vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
```

### Arguments

con	A database connection.
serIDs	identifiers for series on the database.
vintage	character string indicating vintage of the series on the database (if supported by the database).
panel	character string indicating panel of the series on the database (if supported by the database).
...	arguments passed to other methods.

### Details

TSexists returns TRUE or FALSE, depending on whether the series exist at the connection. (All series specified must exist for TRUE.) If vintage is a vector then a corresponding vector result is returned.



**Value**

Depends. See details.

**See Also**

[TSdescription](#), [TSget](#), [TSput](#), [TSdates](#)

---

TSfinddb

*Find a Time Series Database Connection*

---

**Description**

Find a connection to a specified time series database.

**Usage**

```
TSfinddb(dbname=NULL, driverOrder=c("MySQL", "SQLite", "PostgreSQL"))
```

**Arguments**

dbname	Character string indicating the name of a database.
driverOrder	A vector of character string indicating TSdbi drivers in the order they should be tried.

**Details**

TSfinddb tries to establish a connection to the indicated database using the drivers in the order specified. This attempt also requires the corresponding TSdbi driver package (e.g., "TSMYSQL", "TSSQLite", or "TSPostgreSQL"). If the package cannot be loaded then the driver is skipped. The first valid connection is returned. If no valid connection is found then NULL is returned.

**Value**

A connection

**See Also**

[TSdbi-package](#), [dbConnect](#), [TSput](#), [TSget](#), [TSdates](#)

**Description**

Get time series matrix structure from a database

**Usage**

```

TSget(serIDs, con=getOption("TSconnection"), ...)
## S4 method for signature 'character,missing'
TSget(serIDs, con=getOption("TSconnection"), ...)
## S4 method for signature 'character,ANY'
TSget(serIDs, con=getOption("TSconnection"), ...)

```

**Arguments**

con	A database connection.
serIDs	identifiers for series to extract.
...	Arguments passed to other methods. See details.

**Details**

These functions extract data from a database using a connection. This method is generic. The argument `serIDs` should give identifiers for the series to extract.

`TSget` and other functions also provide a way to query a regularly used database by setting the connection in options using `options(TSconnection=con)`, so then only the series identifiers need to be specified in calls to `TSget`.

The user can specify a default time series representation with the argument `TSrepresentation="something"` where "something" is "default" by default, but might be "zoo" or something else which is used to coerce the representation. The `TSrepresentation` is passed in the `...` argument. The conversion is done with the function `changeTSrepresentation`. If the representation is a character string then it is applied using `do.call(TSrepresentation, list(mat, dates))` where `mat` is the time series (matrix) to be return and `dates` are determined by `as.Date(time(x))` where `x` is the default representation of the data. If representation is not a character string then it should be a function and is applied using `TSrepresentation(mat, dates)`

If `TSrepresentation` is not specified, or is specified as "default", then for SQL packages (**TSMysql**, **TSPostgreSQL**, **TSSQLite**, etc) the `ts` representation is used for data from tables "A", "Q", "M", "S" and zoo otherwise. See [TSput](#) for a list of the various tables. For other packages the default is zoo in most cases, but may vary.

It would be possible to specify `TSrepresentation="as.zoo"`, but this may result in `as.zoo` being applied twice, in which case some information about the time representation gets lost, so the best way to get a zoo representation is to specify `TSrepresentation="zoo"`.

Users can set a session default with `options(TSrepresentation="something")` so that this is always passed as an argument to `TSget`.

It is also possible to pass start, end, or tframe information to truncate the returned series. This is part of the ... argument passed to tfwindow. See [tfwindow](#) for more details. By default no truncation is applied.

If the database supports vintages or panels then it is also possible to set defaults for these with, for example, `options(TSvintage="current")` and `options(TSpanel="Canada")`. The default specification has to be supported by the database for this to work.

Also, if the database supports vintages or panels it is possible to give a vector value for one of vintage or panel as long as serIDs is length 1. (That is, only one of serIDs, vintage or panel can have more than one element.) In this case, if names is not specified, vintage or panel will be used for the series names in the returned time series matrix.

names, TSdescription, TSdoc and TSlabel can also be specified as arguments. (Passed in ...).

### Value

A time series matrix.

### See Also

[TSdbi-package](#), [TSconnect](#), [TSput](#), [TSdates](#) [tfwindow](#) [changeTSrepresentation](#)

---

TSput

*Write Data to a Data Connection*

---

### Description

Write data to a server.

### Usage

```
TSput(x, serIDs=seriesNames(x), con=getOption("TSconnection"), ...)

TSdelete(serIDs, con=getOption("TSconnection"),
vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

TSreplace(x, serIDs=seriesNames(x), con=getOption("TSconnection"),
vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

## S4 method for signature 'ANY,missing,missing'
TSput(
x, serIDs=seriesNames(x), con=getOption("TSconnection"), ...)
## S4 method for signature 'ANY,DBIConnection,missing'
TSput(
x, serIDs=seriesNames(x), con=getOption("TSconnection"), ...)
## S4 method for signature 'ANY,character,ANY'
TSput(
x, serIDs=seriesNames(x), con=getOption("TSconnection"), ...)
```

```

    ## S4 method for signature 'character,missing'
TSdelete(
  serIDs, con=getOption("TSconnection"),
  vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
  ## S4 method for signature 'character,ANY'
TSdelete(
  serIDs, con=getOption("TSconnection"),
  vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
  ## S4 method for signature 'character,missing,ANY,ANY'
TSdelete(
  serIDs, con=getOption("TSconnection"),
  vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)
  ## S4 method for signature 'character,ANY,ANY,ANY'
TSdelete(
  serIDs, con=getOption("TSconnection"),
  vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

  ## S4 method for signature 'default'
TSreplace(
  x, serIDs=seriesNames(x), con=getOption("TSconnection"),
  vintage=getOption("TSvintage"), panel=getOption("TSpanel"), ...)

```

### Arguments

con	A database connection.
x	time series data.
serIDs	identifiers for series on the database.
vintage	character string indicating vintage of the series on the database (if supported by the database).
panel	character string indicating panel of the series on the database (if supported by the database).
...	Arguments passed to other methods.

### Details

Class `logicalId` is a logical indicating if the operation succeeded, and also contains meta data indicating how to retrieve the data. (Except in the case of `TSdelete` the data cannot be retrieved.)

These functions write data to a database connection. `TSreplace` removes any existing object first. `TSput` will fail if a series with the same identifier already exists.

`TSput` and `TSreplace` provide ways to query a regularly used single database. The connection can be set in options using `options(TSconnection=con)` and then only the series identifiers need to be specified in calls to `TSput` and `TSreplace`.

`TSdescription` and `TSdoccan` also be set. (Passed in ...).

If an appropriate table cannot be determined from the series it will be necessary to pass the `Table` argument (in ...). The DBI/SQL interface uses the following tables:

A for annual data  
Q for quarterly data  
M for monthly data  
S for semiannual data  
W for weekly data  
D for daily data  
B for business data  
U for minutely data  
I for irregular data with a date  
T for irregular data with a date and time  
Meta for meta data

**Value**

An object of class logicalId.

**See Also**

[TSdbi-package](#), [TSdates](#), [TSget](#), [dbConnect](#)

---

TSsourceInfo

*Get source information from a data object*

---

**Description**

Get source information from an object

**Usage**

```
TSseriesIDs(x)  
TScon(x)  
TSextractionDate(x)
```

**Arguments**

x An object which contains source series information (as returned by TSget).

**Value**

Strings indicating the information.

**See Also**

[TSsource](#), [TSget](#), [TSconnect](#), [TSdates](#)

---

**TSvintages***Indicate all Vintages at a Connection*

---

**Description**

Indicate all vintages on the database(s) associated with a TSconnection.

**Usage**

```
TSvintages(con=getOption("TSconnection"))  
## S4 method for signature 'missing'  
TSvintages(con=getOption("TSconnection"))  
## S4 method for signature 'ANY'  
TSvintages(con=getOption("TSconnection"))
```

**Arguments**

con                    A TSconnection object

**Details**

TSvintages returns the vintage identifiers if available. Otherwise NULL is returned. The result, or subsets of it, can be used as the vintage argument in calls to TSget.

**Value**

A vector of strings indicating vintage identifiers

**See Also**

[TSconnect](#)

# Index

- \*Topic **package**
  - TSdbi-package, 2
- \*Topic **ts**
  - TScheckdbi, 3
  - TSconnect, 4
  - TSdates, 5
  - TSdbi-package, 2
  - TSdescription, 6
  - Tsexists, 8
  - TSfinddb, 9
  - TSget, 10
  - TSput, 11
  - TSsourceInfo, 13
  - TSvintages, 14
- changeTSrepresentation, 11
- conType-class (TSconnect), 4
- dbConnect, 3, 4, 6, 9, 13
- end.TSdates (TSdates), 5
- logicalId-class (TSput), 11
- print, TSdb-method (TSconnect), 4
- show, logicalId-method (TSconnect), 4
- show, TSdb-method (TSconnect), 4
- show, TSmeta-method (TSconnect), 4
- start.TSdates (TSdates), 5
- tfend, 6
- tfend.TSdates (TSdates), 5
- tfstart, 6
- tfstart.TSdates (TSdates), 5
- tfwindow, 11
- TScheckdbi, 3
- TScheckdbi, ANY-method (TScheckdbi), 3
- TScheckdbi, missing-method (TScheckdbi), 3
- TScon (TSsourceInfo), 13
- TSconnect, 3, 4, 11, 13, 14
- TSconnect, character, character-method (TSconnect), 4
- TSdates, 3, 4, 5, 8, 9, 11, 13
- TSdates, character, ANY-method (TSdates), 5
- TSdates, character, missing-method (TSdates), 5
- TSdb-class (TSconnect), 4
- TSdbi-package, 2
- TSdbi.Intro (TSdbi-package), 2
- TSdbiMethods, 3
- TSdelete (TSput), 11
- TSdelete, character, ANY, ANY, ANY-method (TSput), 11
- TSdelete, character, ANY-method (TSput), 11
- TSdelete, character, missing, ANY, ANY-method (TSput), 11
- TSdelete, character, missing-method (TSput), 11
- TSdescription, 6, 6, 9
- TSdescription, ANY, missing-method (TSdescription), 6
- TSdescription, character, ANY-method (TSdescription), 6
- TSdescription, character, missing-method (TSdescription), 6
- TSdescription, missing, ANY-method (TSdescription), 6
- TSdescription, missing, missing-method (TSdescription), 6
- TSdescription<- (TSdescription), 6
- TSdoc (TSdescription), 6
- TSdoc, ANY, missing-method (TSdescription), 6
- TSdoc, character, ANY-method (TSdescription), 6
- TSdoc, character, missing-method

- (TSdescription), 6
- TSdoc,missing,ANY-method  
(TSdescription), 6
- TSdoc,missing,missing-method  
(TSdescription), 6
- TSdoc<- (TSdescription), 6
- TSexists, 8, 8
- TSexists,default-method (TSexists), 8
- TSextractionDate (TSsourceInfo), 13
- TSfinddb, 9
- TSget, 3, 4, 6, 8, 9, 10, 13
- TSget,character,ANY-method (TSget), 10
- TSget,character,missing-method (TSget),  
10
- TSid-class (TSconnect), 4
- TSlabel (TSdescription), 6
- TSlabel,ANY,missing-method  
(TSdescription), 6
- TSlabel,character,ANY-method  
(TSdescription), 6
- TSlabel,character,missing-method  
(TSdescription), 6
- TSlabel,missing,ANY-method  
(TSdescription), 6
- TSlabel,missing,missing-method  
(TSdescription), 6
- TSlabel<- (TSdescription), 6
- TSmeta (TSdescription), 6
- TSmeta,ANY,missing-method  
(TSdescription), 6
- TSmeta,character,ANY-method  
(TSdescription), 6
- TSmeta,character,missing-method  
(TSdescription), 6
- TSmeta-class (TSdescription), 6
- TSmeta<- (TSdescription), 6
- TSput, 3, 4, 6, 8-11, 11
- TSput,ANY,character,ANY-method (TSput),  
11
- TSput,ANY,character,missing-method  
(TSput), 11
- TSput,ANY,DBIConnection,missing-method  
(TSput), 11
- TSput,ANY,missing,missing-method  
(TSput), 11
- TSrefperiod (TSdescription), 6
- TSrefperiod,default-method  
(TSdescription), 6
- TSrefperiod<- (TSdescription), 6
- TSreplace (TSput), 11
- TSreplace,default-method (TSput), 11
- TSseriesIDs (TSsourceInfo), 13
- TSsource, 13
- TSsource (TSdescription), 6
- TSsource,ANY,missing-method  
(TSdescription), 6
- TSsource,character,ANY-method  
(TSdescription), 6
- TSsource,character,missing-method  
(TSdescription), 6
- TSsource,missing,ANY-method  
(TSdescription), 6
- TSsource,missing,missing-method  
(TSdescription), 6
- TSsource<- (TSdescription), 6
- TSsourceInfo, 13
- TSvintages, 14
- TSvintages,ANY-method (TSvintages), 14
- TSvintages,missing-method (TSvintages),  
14