Package 'fBonds'

July 22, 2025

Title Rmetrics - Pricing and Evaluating Bonds

Date 2017-11-12

Version 3042.78

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Description It implements the Nelson-Siegel and the Nelson-Siegel-Svensson term structures.

Depends R (>= 2.15.1), timeDate, timeSeries, fBasics

Imports graphics, stats

Suggests RUnit

LazyData yes

License GPL (>= 2)

URL http://www.rmetrics.org

NeedsCompilation no

Repository CRAN

Date/Publication 2017-11-15 22:30:09 UTC

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fBonds-package *Pricing and Evaluating Bonds*

Description

The Rmetrics "fBonds" package is a collection of functions for pricing and evaluating bonds and to compute term structures.

Details

```
Package:    \tab fBonds\cr
Type:       \tab Package\cr
Version:    \tab R 3.0.1\cr
Date:       \tab 2014\cr
License:    \tab GPL Version 2 or later\cr
Copyright:  \tab (c) 1999-2014 Rmetrics Assiciation\cr
URL:        \tab \url{https://www.rmetrics.org}
```

1 Introduction

This section provides functions to valuate Bonds and to calculate term structures.

2 Term Structure Calculation

This section provides two functions for term structure modelling based on the Nelson-Siegel, and on the Svennson approach.

```
NelsonSiegel    models Nelson-Siegel Term Structure
Svensson        models Nelson-Siegel-Svensson Term Structure
```

About Rmetrics

The fBonds Rmetrics package is written for educational support in teaching "Computational Finance and Financial Engineering" and licensed under the GPL.

`TermStructure` *Term Structure Modelling*

Description

A collection and description of functions for term structure modelling.

The functions are:

`NelsonSiegel`	Nelson-Siegel Term Structure,
`Svensson`	Nelson-Siegel-Svensson Term Structure.

Usage

```
NelsonSiegel(rate, maturity, doplot = TRUE)
Svensson(rate, maturity, doplot = TRUE)
```

Arguments

`doplot`	a logical. Should a plot be displayed?
`maturity`	a numeric vector of maturities on an annual scale.
`rate`	a numeric vector of forward rates.

Value

a list object with entries returned from the optimization function `nlminb`.

References

McCulloch J. H. (1990); *US Term Structure Data: 1946-87*, Handbook of Monetary Economics, Friedman B.M. and Hahn F.H. (eds.), Elsevier Science.

McCulloch J. H. and Kwon, H.C. (1993); *US Term Structure Data: 1947-1991*, Working Paper No. 93-6, Department of Economics, Ohio State University.

Zivot E., Wang J.; *Modeling Financial Time Series with S-Plus*.

Examples

```
Yield = c(
0.04984, 0.05283, 0.05549, 0.05777, 0.05961, 0.06102, 0.06216, 0.06314,
0.06403,
0.06488, 0.06568, 0.06644, 0.06717, 0.06786, 0.06852, 0.06913, 0.06969,
0.07020,
0.07134, 0.07205, 0.07339, 0.07500, 0.07710, 0.07860, 0.08011, 0.08114,
0.08194,
0.08274, 0.08355, 0.08434, 0.08512, 0.08588, 0.08662, 0.08731, 0.08794,
0.08851,
0.08900, 0.08939, 0.08967, 0.08980, 0.08976, 0.08954, 0.08910, 0.08843,
```

```
0.08748,
0.08626, 0.08474, 0.08291)

Maturity = c(
  0.083,  0.167,  0.250,  0.333,  0.417,  0.500,  0.583,  0.667,
0.750,  0.833,
  0.917,  1.000,  1.083,  1.167,  1.250,  1.333,  1.417,  1.500,
1.750,  2.000,
  2.500,  3.000,  4.000,  5.000,  6.000,  7.000,  8.000,  9.000, 10.000,
11.000,
 12.000, 13.000, 14.000, 15.000, 16.000, 17.000, 18.000, 19.000, 20.000,
21.000,
 22.000, 23.000, 24.000, 25.000, 26.000, 27.000, 28.000, 29.000)

NelsonSiegel(Yield, Maturity)

par(mfrow = c(2, 2))
Svensson(Yield, Maturity)
```

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