Package 'qrmdata'

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Encoding UTF-8

Title Data Sets for Quantitative Risk Management Practice

Description Various data sets (stocks, stock indices, constituent data, FX, zero-coupon bond yield curves, volatility, commodities) for Quantitative Risk Management practice.

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Depends R (>= 3.5.0)

Imports xts

Suggests knitr, qrmtools, lattice

Enhances

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R topics documented:

`commodities` *Commodity Data*

Description

Data sets containing commodities.

Usage

```
data("OIL_Brent")
data("GOLD")
```

Format

`xts` objects containing the Brent Crude price in USD per barrel (for `OIL_Brent`) and the World Gold Council gold price in USD per troy ounce (for `GOLD`).

Author(s)

Marius Hofert

Source

The data was obtained from Federal Reserve Economic Data (FRED) via Quandl on 2016-01-03 with the function `get_data()` from **qrmtools**.

Examples

```
data("OIL_Brent")
data("GOLD")
```

crypto *Cryptocurrency Prices in USD*

Description

Bitcoin, Ethereum, Litecoin and Ripple prices in USD (from their first available date onwards).

Usage

```
data("crypto")
```

Format

`xts` object containing cryptocurrency prices in USD of Bitcoin (ticker symbol "BTC-USD"), Ethereum (ticker symbol "ETH-USD"), Litecoin (ticker symbol "LTC-USD") and Ripple (ticker symbol "XRP-USD") from their first available date onwards.

Author(s)

Marius Hofert

Source

The data was obtained from Yahoo Finance on 2018-05-29 via the function `get_data()` from **qrm-tools**.

Examples

```
data("crypto")
str(crypto)
library(xts)
plot.zoo(crypto, main = "Cryptocurrencies in USD", xlab = "Time")
```

default *Standard & Poor's Default Data*

Description

A three-dimensional array containing the default data for A-, BBB-, BB-, B- and C-rated companies for the years from 1981 to 2000.

Usage

```
data("SP_defaults")
```

Format

xts objects containing foreign exchange rates of Canadian Dollar (CAD_*), US Dollar (USD_*), British Pound (GBP_*), Euro (EUR_*), Swiss Francs (CHF_*), Japanese Yen (JPY_*), Chinese Yuan (CNY_*) with respect to USD (*_USD) and GBP (*_GBP) from 2000-01-01 to 2015-12-31.

Author(s)

Marius Hofert

Source

Standard & Poor's Credit Monitor

Examples

```
data("SP_defaults")
```

---

fx *Foreign Exchange Rate Data*

Description

Foreign exchange rate data with respect to USD and GBP.

Usage

```
data("CAD_USD")
data("GBP_USD")
data("EUR_USD")
data("CHF_USD")
data("JPY_USD")
data("CNY_USD")
data("CAD_GBP")
data("USD_GBP")
data("EUR_GBP")
data("CHF_GBP")
data("JPY_GBP")
data("CNY_GBP")
```

Format

xts objects containing foreign exchange rates of Canadian Dollar (CAD_*), US Dollar (USD_*), British Pound (GBP_*), Euro (EUR_*), Swiss Francs (CHF_*), Japanese Yen (JPY_*), Chinese Yuan (CNY_*) with respect to USD (*_USD) and GBP (*_GBP) from 2000-01-01 to 2015-12-31.

Details

Interpretation: As an example, EUR_USD contains the EUR/USD exchange rate, so a value x in EUR_USD indicates that 1 EUR is worth x USD at that point in time.

Author(s)

Marius Hofert

Source

The data was obtained from OANDA (https://www.oanda.com/) on 2016-01-03 via the function get_data() from **qrmtools**.

Examples

```
data("CAD_USD")
data("GBP_USD")
data("EUR_USD")
data("CHF_USD")
data("JPY_USD")
data("CNY_USD")
data("CAD_GBP")
data("USD_GBP")
data("EUR_GBP")
data("CHF_GBP")
data("JPY_GBP")
data("CNY_GBP")
```

---

interest_rates *Interest-Rate Data*

Description

Zero-coupon bond yield curves in CAD and USD.

Usage

```
data("ZCB_CAD")
data("ZCB_USD")
```

Format

ZCB_CAD: xts object containing, in each row, zero-coupon bond yield curves in percent for 120 times to maturity (ranging from 0.25 to 30 years); only trading days from 1991-01-02 to 2015-08-31 with available values for all maturities are included.

ZCB_USD: xts object containing, in each row, zero-coupon bond yield curves in percent for 30 times to maturity (ranging from 1 to 30 years); only trading days from 1985-11-25 to 2015-12-29 with available values for all maturities are included.

Author(s)

Marius Hofert

Source

ZCB_CAD was created from data obtained from https://www.bankofcanada.ca/rates/interest-rates/bond-yield-curves/ multiplied by 100. ZCB_USD was obtained from https://data.nasdaq.com/data/FED/SVENY-us-treasury-zerocoupon-yield-curve/ via Quandl. Both data sets were drawn on 2016-01-03 (ZCB_USD via the function get_data() from **qrmtools**).

Examples

```
data("ZCB_CAD")
data("ZCB_USD")
mat <- as.matrix(ZCB_USD['2015-01-01/2015-12-31',])
df <- data.frame(Day = rep(1:nrow(mat), each = ncol(mat)),
                 Maturity = rep(1:ncol(mat), nrow(mat)),
                 Value = as.vector(t(mat)))
lattice::wireframe(Value ~ Day * Maturity, data = df,
                   alpha.regions = 0.5,
                   scales = list(arrows = FALSE, col = "black"),
                   par.settings = list(axis.line = list(col = "transparent")))
```

---

losses *Loss Datasets*

Description

Danish fire insurance claims in 1M DKK in Denmark from 1980-01-03 to 1990-12-31. Largest 1% of simulated losses of Norwegian bank DNB.

Usage

```
data("fire")
data("DNB")
```

Format

`fire`: univariate xts object with 2167 observations.

`DNB`: (25000, 3)-matrix containing the largest 1% of simulated (market risk, credit risk, asset risk) losses of DNB; see Aas and Puccetti (2014, Section 2).

Author(s)

Marius Hofert

Source

`fire`: Originally Mette Rytgaard (Copenhagen Re).

`DNB`: Originally Kjersti Aas and Giovanni Puccetti.

References

Aas, K. and Puccetti, G. (2014). Bounds for total economic capital: the DNB case study. *Extremes* **17**(4), 693–715.

Examples

```
library(xts)
## Danish fire losses
data("fire")
str(fire)
stopifnot(inherits(fire, "xts"), length(fire) == 2167)
plot.zoo(fire, ylab = "Fire insurance claim")

## Largest 1% of simulated DNB losses
data("DNB")
stopifnot(dim(DNB) == c(25000, 3))
```

---

stock_data *(Single) Stock Data*

Description

Single stock data; only Radioshack at the moment.

Usage

```
data("RSHCQ")
```

Format

An `xts` object containing adjusted close prices of Radioshack (`RSHCQ`; ticker symbol "RSHCQ") from 1982-01-04 to 2015-01-20.

Author(s)

Marius Hofert

Source

Radioshack defaulted early 2015. Yahoo Finance did not provide adjusted close prices thereafter. We thus used the adjusted close prices from 1982-01-04 to 2015-01-20 which we drew from Yahoo Finance on 2015-01-21 via the function `get_data()` from **qrmtools**.

Examples

```
data("RSHCQ")
```

`stock_indices` *Stock Index Data*

Description

Single stock indices.

Usage

```
data("SP500")
data("DJ")
data("NASDAQ")
data("FTSE")
data("SMI")
data("EURSTOXX")
data("CAC")
data("DAX")
data("CSI")
data("HSI")
data("SSEC")
data("NIKKEI")
```

Format

`xts` objects containing adjusted close prices of the S&P 500 (`SP500`; ticker symbol "^GSPC"), Dow Jones (`DJ`; ticker symbol "^DJI"), NASDAQ 100 (`NASDAQ`; ticker symbol "^NDX"), FTSE 100 (`FTSE`; ticker symbol "^FTSE"), Swiss Market Index (`SMI`; ticker symbol "^SSMI"), Euro Stoxx 50 (`EURSTOXX`; ticker symbol "^STOXX50E"), Cotation Assistée en Continu (`CAC`; ticker symbol "^FCHI"), Deutscher Aktienindex (`DAX`; ticker sybmol "^GDAXI"), China Securities Index (`CSI`; ticker sybmol "000300.SS"), Hang Seng Index (`HSI`; ticker symbol "^HSI"), Shanghai Stock Exchange Composite Index (`SSEC`; ticker symbol "000001.SS") and the NIKKEI (`NIKKEI`; ticker symbol "^N225") from their first date of availablility to 2015-12-31.

Author(s)

Marius Hofert

Source

The data was obtained from Yahoo Finance on 2016-01-03 via the function `get_data()` from **qrmtools**.

Examples

```
data("SP500")
data("DJ")
data("NASDAQ")
data("FTSE")
data("SMI")
data("EURSTOXX")
data("CAC")
data("DAX")
data("CSI")
data("HSI")
data("SSEC")
data("NIKKEI")
```

---

stock_indices_constituents

Stock Index Constituents Data

Description

Constituent data of various stock indices.

Usage

```
data("SP500_const")
data("DJ_const")
data("FTSE_const")
data("EURSTX_const")
data("HSI_const")
```

Format

`xts` objects containing adjusted close prices of the constituents of the respective stock indices. These are the S&P 500 constituents (`SP500_const` with corresponding Global Industry Classification Standard (GICS) information `SP500_const_info`; see https://en.wikipedia.org/wiki/List_of_S%26P_500_companies; given these tickers, the data was obtained from Yahoo! Finance) as of 2015-10-12, the Dow Jones constituents (`DJ_const`; information about the constituents not available anymore) as of 2016-01-03, the FTSE 100 constituents (`FTSE_const`; see https://uk.finance.yahoo.com/quote/%5EFTSE/components?ltr=1/) as of 2016-01-03 (the data was only available for 98 constituents), the Euro Stoxx 50 constituents (`EURSTX_const`; see https://uk.finance.yahoo.com/quote/%5ESTOXX50E/components?ltr=1/) as of 2016-01-03 (the data was only available for 98 constituents) and the Hang Seng Index constituents (`HSI_const`; see https://uk.finance.yahoo.com/quote/%5EHSI/components?ltr=1/) as of 2016-01-03.

The constituents data ranges from the first date at least one of the constituents is available (with missing data if not available) to 2015-12-31.

Author(s)

Marius Hofert

Source

The data was obtained from the respective URLs on 2016-01-03 via the function `get_data()` from **qrmtools**.

Note that for the S&P 500 constituents, the data was rounded to two decimal places to reduce the file size of the data set.

Examples

```
data("SP500_const")
data("DJ_const")
data("FTSE_const")
data("EURSTX_const")
data("HSI_const")
```

---

volatility *Volatility Index*

Description

Chicago Board Options Exchange (CBOE) volatility index (VIX) data.

Usage

```
data("VIX")
```

Format

An `xts` object containing the volatility index (`VIX`; ticker symbol "^VIX") from its first date of availablility to 2015-12-31.

Details

The VIX is typically used as a market-based measure of volatility in percent; see the white paper `https://cdn.cboe.com/resources/vix/vixwhite.pdf` on how the VIX is constructed.

Author(s)

Marius Hofert

Source

The data was obtained from Yahoo Finance on 2016-01-03 via the function `get_data()` from **qrmtools**.

Examples

```
data("VIX")
```

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