Package 'LIHNPSD'

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Type Package

Title Poisson Subordinated Distribution

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Description Poisson Subordinated Distribution

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Depends sn, moments, BB, Bolstad2, optimx, agsemisc, Rmpfr

R topics documented:

LIHNPSD-package *Poisson Subordinated Distribution*

Description

A new Poisson subordinated distribution is proposed to capture major leptokurtic features in log-return time series of financial data. This distribution is intuitive, easy to calculate, and converge quickly. It fits well to the historical daily log-return distributions of currencies, commodities, Treasury yields, VIX, and, most difficult of all, DJIA. It serves as a viable alternative to the more sophisticated truncated stable distribution.

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References

On a Poisson Subordinated Distribution for Precise Statistical Measurement of Leptokurtic Financial Data, to be published on SSRN.

Examples

```
# Load the daily log-return data of DJIA
data(dji_logr)

# Construct the S3 object for PSD
dist <- list( sigma= 0.004625, alpha= 0.292645, gamma= 0.482744, beta= -0.154049, location= 0.002968 )
class(dist) <- "LIHNPSD"
dist <- rawmean(dist)

# A simple graph of the distribution's log PDF
x <- seq(-0.1,0.1,by=0.1/1000)
plot( x, log(rawdensity(dist,x)), pch=".")

# The more sophisticated fit and graphs
dt <- LIHNPSD_prepare_data(dji_logr, breaks=160, merge_tails=c(4,2))
th <- LIHNPSD_theoretical_result(dist, dt)
LIHNPSD_plot_std4gr(th, dt)
```

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dji_logr *Log-return of DJIA*

Description

Log-return data of DJIA from 1930 to 2011

Usage

```
data(dji_logr)
```

References

See Yahoo Finance ^DJI for more details.

gold_logr *Log-return of spot gold*

Description

Log-return data of spot gold (London PM fixing) from 1972 to 2009

Usage

```
data(gold_logr)
```

References

See LBMA website for more details.

r10y_logr *Log-return of R10Y*

Description

Log-return data of R10Y (10-Year Treasury yield) from 1962 to 2011

Usage

```
data(r10y_logr)
```

References

See Federal Reserve Board website for more details.

rawdensity *The raw probability density function of PSD*

Description

The raw probability density function of PSD (without location parameter)

Usage

```
  ## S3 method for class 'LIHNPSD'
rawdensity(d, x)
```

Arguments

d	PSD S3 object

Details

What does raw means? Without location ? What does it means?

Value

Return the PDF(x)

References

See SSRN papaer

See Also

SPSD

SPSD *Simple PSD constructor*

Description

Construct an S3 object for PSD in double-precision or MPFR

Usage

```
SPSD(sigma, alpha, gamma, beta=0, mpfr=0)
```

Arguments

sigma	sigma value of PSD
alpha	alpha value of PSD
gamma	gamma value of PSD
beta	optional beta value of PSD for skewness
mpfr	optional mpfr precision. Default is 0, which sets all calculations in double precision. For MPFR, set it to an integer, typically one of 64, 96, 128.

Value

Return an S3 object of LIHNPSD class that can be used for subsequent calculation.

Note

This constructor doesn't include the location parameter.

See Also

See also package's example for the DJIA parameters.

Examples

```
# Normal distribution
SPSD( 1,0,0 )
# PSD that approximate DJIA
SPSD(0.004625, 0.292645, 0.482744, -0.154049)
```

szd_logr *Log-return of SZD/USD*

Description

Log-return data of SZD/USD exchange rate from 1975 to 2008

Usage

```
data(szd_logr)
```

References

See Federal Reserve Board website for more details.

vix_logr *Log-return of VIX*

Description

Log-return data of VIX from 1990 to 2011

Usage

```
data(vix_logr)
```

References

See Yahoo Finance ^VIX for more details.

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