Package 'Jdmbs'

February 15, 2017

Type Package

Title Monte Carlo Option Pricing Algorithm for Jump Diffusion Model with Correlation Companies

Version 1.0

Date 2017-02-15

Description Black-Scholes Model [Black (1973) <doi:10.1086/260062>] is important to calculate option premium in the stock market. And variety of improved models are studied. In this package, I proposed functions in order to calculate normal and new Jump Diffusion Models [Kou (2002) <doi:10.1287/mnsc.48.8.1086.166>] by Monte Carlo Method. This package can be used for Computational Finance.

Depends R (>= 3.2.3)

License GPL (>= 2)

Imports igraph, rmarkdown, graphics, stats, utils

Encoding UTF-8

LazyData true

RoxygenNote 5.0.1

Maintainer Masashi Okada <okadaalgorithm@gmail.com>

Suggests knitr, testthat

VignetteBuilder knitr

NeedsCompilation no

Author Masashi Okada [aut, cre]

Repository CRAN

Date/Publication 2017-02-15 16:47:11

R topics documented:

data *correlation coefficients between all pair companies*

Description

A dataset containing a matrix of correlation coefficients between all pair companies. 6 row and 6 col.

Usage

```
data
```

Format

An object of class `data.frame` with 6 rows and 6 columns.

jdm_bs *A Monte Carlo Option Pricing Algorithm for Jump Diffusion Model*

Description

A Monte Carlo Option Pricing Algorithm for Jump Diffusion Model

Usage

```
jdm_bs(companies, simulation.length = 180, monte_carlo = 1000, start_price,
  mu, sigma, event_times, jump, K, color)
```

Arguments

`companies`	an integer of company number in order to simulate.
`simulation.length`	an integer of a duration of simulation.
`monte_carlo`	an integer of iterations of monte carlo.
`start_price`	a vector of company's initial stock prices.
`mu`	a vector of parameter of Geometric Brownian motion.
`sigma`	a vector of parameter of Geometric Brownian motion.
`event_times`	an integer of how many times jump in Unit time.
`jump`	a vector of jump parameter.
`K`	a vector of option execution prices.
`color`	a vector of colors in plot.

Value

premium a list of (call_premium, put_premium)

Examples

```
jdm_bs(3 ,simulation.length=60,monte_carlo=60, c(1000,500,500), c(0.005, 0.025, 0.01),
c(0.08,0.04,0.06), 3, c(0.1,0.1,0.1), c(2500,3000,1500), c("red","blue","green"))
```

`jdm_new_bs` *A Monte Carlo Option Pricing Algorithm for Jump Diffusion Model with Correlation Companies*

Description

A Monte Carlo Option Pricing Algorithm for Jump Diffusion Model with Correlation Companies

Usage

```
jdm_new_bs(companies_data, companies, simulation.length = 180,
  monte_carlo = 1000, start_price, mu, sigma, event_times, jump, K, color)
```

Arguments

`companies_data`	a matrix of a correlation coefficient of companies
`companies`	an integer of company number in order to simulate.
`simulation.length`	an integer of a duration of simulation.
`monte_carlo`	an integer of iterations of monte carlo.
`start_price`	a vector of company's initial stock prices.
`mu`	a vector of parameter of Geometric Brownian motion.
`sigma`	a vector of parameter of Geometric Brownian motion.
`event_times`	an integer of how many times jump in Unit time.
`jump`	a vector of jump parameter.
`K`	a vector of option execution prices.
`color`	a vector of colors in plot.

Value

premium a list of (call_premium, put_premium)

Examples

```
jdm_new_bs(matrix(c(1,0.2,0.3,0.4,1,0.6,0.7,0.8,1), nrow=3, ncol=3),
3, simulation.length=60,monte_carlo=60, c(1000,500,500), c(0.005, 0.025, 0.01),
c(0.08,0.04,0.06), 3, c(0.1,0.1,0.1), c(2500,3000,1500), c("red","blue","green"))
```

normal_bs *Normal A Monte Carlo Option Pricing Algorithm*

Description

Normal A Monte Carlo Option Pricing Algorithm

Usage

```
normal_bs(companies, simulation.length = 180, monte_carlo = 1000,
  start_price, mu, sigma, K, color)
```

Arguments

companies	an integer of company number in order to simulate.
simulation.length	an integer of a duration of simulation.
monte_carlo	an integer of iterations of monte carlo.
start_price	a vector of company's initial stock prices.
mu	a vector of parameter of Geometric Brownian motion.
sigma	a vector of parameter of Geometric Brownian motion.
K	a vector of option execution prices.
color	a vector of colors in plot.

Value

premium a list of (call_premium, put_premium)

Examples

```
normal_bs(1, simulation.length=50, monte_carlo=100,1000, 0.007, 0.03, 3000, "blue")
```

Index