

Package ‘vasicek’

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Title Miscellaneous Functions for Vasicek Distribution

Version 0.0.1

Description Provide a collection of miscellaneous R functions related to the Vasicek distribution with the intent to make the lives of risk modelers easier.

License GPL (>= 2)

URL <https://github.com/statcompute/vasicek>

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Imports stats

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vsk_cdf

Calculating the cumulative distribution function of Vasicek

Description

The function vsk_cdf calculates the cumulative distribution function of Vasicek.

Usage

```
vsk_cdf(x, Rho, P)
```

Arguments

x	A numeric vector in the [0, 1] interval that is supposed to follow the Vasicek distribution
Rho	The Rho parameter in the Vasicek distribution
P	The P parameter in the Vasicek distribution

Value

A numeric vector with the corresponding cdf.

Examples

```
vsk_cdf(c(0.278837772815679, 0.5217229060260343), Rho = 0.2, P = 0.3)
# [1] 0.5 0.9
```

vsk_imm

Estimating Vasicek parameters by using indirect moment matching

Description

The function vsk_imm estimates parameters in the Vasicek distribution by using indirect moment matching.

Usage

```
vsk_imm(x)
```

Arguments

x	A numeric vector in the (0, 1) interval that is supposed to follow the Vasicek distribution
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Value

A list with Vasicek parameters, namely Rho and P.

Examples

```
vsk_imm(vsk_rvs(1000, Rho = 0.2, P = 0.1))
# $Rho
# [1] 0.2110422
# $P
# [1] 0.1024877
```

vsk_mle

Estimating Vasicek parameters by using maximum likelihood estimator

Description

The function `vsk_mle` estimates parameters in the Vasicek distribution by using maximum likelihood estimator.

Usage

```
vsk_mle(x)
```

Arguments

`x` A numeric vector in the (0, 1) interval that is supposed to follow the Vasicek distribution

Value

A list with Vasicek parameters, namely Rho and P.

Examples

```
vsk_mle(vsk_rvs(1000, Rho = 0.2, P = 0.1))
# $Rho
# [1] 0.2110976
# $P
# [1] 0.1025469
```

vsk_pdf

*Calculating the probability density function of Vasicek***Description**

The function vsk_pdf calculates the probability density function of Vasicek.

Usage

```
vsk_pdf(x, Rho, P)
```

Arguments

x	A numeric vector in the (0, 1) interval that is supposed to follow the Vasicek distribution
Rho	The Rho parameter in the Vasicek distribution
P	The P parameter in the Vasicek distribution

Value

A numeric vector with the corresponding pdf.

Examples

```
vsk_pdf(c(0.01, 0.02), Rho = 0.2, P = 0.3)
# [1] 0.07019659 0.22207564
```

vsk_ppf

*Calculating the percentile point function of Vasicek***Description**

The function vsk_ppf calculates the percentile point function of Vasicek.

Usage

```
vsk_ppf(Alpha, Rho, P)
```

Arguments

Alpha	A numeric vector of probabilities
Rho	The Rho parameter in the Vasicek distribution
P	The P parameter in the Vasicek distribution

Value

A numeric vector with the corresponding ppf.

Examples

```
vsk_ppf(c(0.5, 0.9), Rho = 0.2, P = 0.3)
# [1] 0.2788378 0.5217229
```

vsk_rvs

Generating random numbers for the Vasicek distribution

Description

The function `vsk_rvs` generates random numbers for the Vasicek distribution.

Usage

```
vsk_rvs(n, Rho, P, seed = 1)
```

Arguments

<code>n</code>	An integer for the number of observations.
<code>Rho</code>	The Rho parameter in the Vasicek distribution. It is in the range of (0, 1).
<code>P</code>	The P parameter in the Vasicek distribution. It is in the range of (0, 1).
<code>seed</code>	An integer that is used as the seed value to generate random numbers.

Value

A list of random number that follows the Vasicek distribution.

Examples

```
vsk_rvs(10, Rho = 0.2, P = 0.1)
```

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