Package 'NetSimR'

April 22, 2021

Type Package

Title Actuarial Functions for Non-Life Insurance Modelling

Version 0.1.1

Author Yiannis Parizas [aut, cre]

Maintainer Yiannis Parizas <yiannis.parizas@gmail.com>

Description Assists actuaries and other insurance modellers in pricing, reserving and capital modelling for non-life insurance and reinsurance modelling. Provides functions that help model excess levels, capping and pure Incurred but not reported claims (pure IBNR).
Includes capped mean, exposure curves and increased limit factor curves (ILFs) for LogNormal, Gamma, Pareto, Sliced LogNormal-Pareto and Sliced Gamma-Pareto distributions.
Includes mean, probability density function (pdf), cumulative probability function (cdf) and inverse cumulative probability function for Sliced LogNormal-Pareto and Sliced Gamma-Pareto distributions.
Includes calculating pure IBNR exposure with LogNormal and Gamma distribution for reporting delay.

License GPL-3

Encoding UTF-8

Suggests knitr, crch, testthat, rmarkdown

VignetteBuilder knitr

RoxygenNote 7.1.1

NeedsCompilation no

Repository CRAN

Date/Publication 2021-04-22 01:50:02 UTC

R topics documented:

dSlicedGammaPareto 2

dSlicedLNormPareto . . . 3
erf . . . 4
ExposureCurveGamma . . . 5
ExposureCurveLNorm . . . 5
ExposureCurvePareto . . . 6
ExposureCurveSlicedGammaPareto . . . 7
ExposureCurveSlicedLNormPareto . . . 8
GammaCappedMean . . . 8
IGamma . . . 9
ILFGamma . . . 10
ILFLNorm . . . 10
ILFPareto . . . 11
ILFSlicedGammaPareto . . . 12
ILFSlicedLNormPareto . . . 13
LNormCappedMean . . . 14
NetSimR . . . 14
ParetoCappedMean . . . 15
ParetoCappedMeanCalc . . . 16
pSlicedGammaPareto . . . 16
pSlicedLNormPareto . . . 17
PureIBNRGamma . . . 18
PureIBNRLNorm . . . 19
qSlicedGammaPareto . . . 20
qSlicedLNormPareto . . . 21
SlicedGammaParetoCappedMean . . . 22
SlicedGammaParetoMean . . . 23
SlicedLNormParetoCappedMean . . . 23
SlicedLNormParetoMean . . . 24

Index **26**

`dSlicedGammaPareto` *The probability density function (pdf) of a Sliced Gamma Pareto severity distribution*

Description

The probability density function (pdf) of a Sliced Gamma Pareto severity distribution

Usage

```
dSlicedGammaPareto(x, GShape, GRate, SlicePoint, PShape)
```

Arguments

x	A positive real number - the claim amount where the probability density function (pdf) will be evaluated.
GShape	A positive real number - the shape parameter of the attritional Claim Severity's Gamma distribution.
GRate	A positive real number - the rate parameter of the attritional Claim Severity's Gamma distribution.
SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
PShape	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The value of the probability density function (pdf) at x with an attritional claim Gamma distribution with parameters GShape and GRate and a large claim Pareto distribution with parameters SlicePoint and PShape.

Examples

```
dSlicedGammaPareto(3000,1,0.0005,1000,1.2)
dSlicedGammaPareto(1000,1.1,0.0006,2000,1.6)
dSlicedGammaPareto(2000,1.2,0.0004,3000,1.4)
```

---

dSlicedLNormPareto *The probability density function (pdf) of a Sliced LogNormal Pareto severity distribution*

Description

The probability density function (pdf) of a Sliced LogNormal Pareto severity distribution

Usage

```
dSlicedLNormPareto(x, mu, sigma, SlicePoint, shape)
```

Arguments

x	A positive real number - the claim amount where the probability density function (pdf) will be evaluated.
mu	A real number - the first parameter of the attritional Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the attritional Claim Severity's LogNormal distribution.

SlicePoint	A positive real number - the slice point and the scale parameter of the Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the Claim Severity's Pareto distribution.

Value

The value of the probability density function (pdf) at x with an attritional claim LogNormal distribution with parameters mu and sigma and a large claim Pareto distribution with parameters SlicePoint and shape.

Examples

```
dSlicedLNormPareto(1200,6,1.5,1000,1.2)
dSlicedLNormPareto(4000,7,1.6,3000,1.4)
```

---

erf *Error function*

Description

Error function

Usage

```
erf(x)
```

Arguments

x	A real number.

Value

The value of the error function at x.

Examples

```
erf(0.1)
erf(0.5)
```

ExposureCurveGamma *Exposure Curve from a Gamma severity distribution*

Description

Exposure Curve from a Gamma severity distribution

Usage

```
ExposureCurveGamma(x, shape, rate)
```

Arguments

x	A positive real number - the claim amount where the exposure curve will be evaluated.
shape	A positive real number - the shape parameter of the Claim Severity's Gamma distribution.
rate	A positive real number - the rate parameter of the Claim Severity's Gamma distribution.

Value

The value of the Exposure curve at x with Claim Severity from a Gamma distribution with parameters shape and rate.

Examples

```
ExposureCurveGamma(700,1,0.0005)
ExposureCurveGamma(1000,1.5,0.0006)
```

ExposureCurveLNorm *Exposure Curve from LogNormal a severity distribution*

Description

Exposure Curve from LogNormal a severity distribution

Usage

```
ExposureCurveLNorm(x, mu, sigma)
```

Arguments

x	A positive real number - the claim amount where the exposure curve will be evaluated.
mu	A real number - the first parameter of the Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the Claim Severity's LogNormal distribution.

Value

The value of the Exposure curve at x with Claim Severity from a LogNormal distribution with parameters mu and sigma.

Examples

```
ExposureCurveLNorm(2000,6,1.5)
ExposureCurveLNorm(1000,5,1.6)
```

ExposureCurvePareto *Exposure Curve from a Pareto severity distribution*

Description

Exposure Curve from a Pareto severity distribution

Usage

```
ExposureCurvePareto(x, scale, shape)
```

Arguments

x	A positive real number - the claim amount where the exposure curve will be evaluated.
scale	A positive real number - the scale parameter of the Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the Claim Severity's Pareto distribution.

Value

The value of the Exposure curve at x with Claim Severity from a Pareto distribution with parameters scale and shape.

Examples

```
ExposureCurvePareto(700,500,1.2)
ExposureCurvePareto(20000,200,1.1)
```

`ExposureCurveSlicedGammaPareto` *Exposure Curve from a Sliced Gamma Pareto severity distribution*

Description

Exposure Curve from a Sliced Gamma Pareto severity distribution

Usage

```
ExposureCurveSlicedGammaPareto(x, GShape, GRate, SlicePoint, PShape)
```

Arguments

`x`	A positive real number - the claim amount where the exposure curve will be evaluated.
`GShape`	A positive real number - the shape parameter of the Claim Severity's Gamma distribution.
`GRate`	A positive real number - the rate parameter of the Claim Severity's Gamma distribution.
`SlicePoint`	A positive real number - the slice point and the scale parameter of the Claim Severity's Pareto distribution.
`PShape`	A positive real number - the shape parameter of the Claim Severity's Pareto distribution.

Value

The value of the Exposure curve at `x` with an attritional claim Gamma distribution with parameters `GShape` and `GRate` and a large claim Pareto distribution with parameters `SlicePoint` and `PShape`.

Examples

```
ExposureCurveSlicedGammaPareto(3000,1,0.0005,1000,1.2)
ExposureCurveSlicedGammaPareto(1000,1.1,0.0006,2000,1.6)
ExposureCurveSlicedGammaPareto(2000,1.2,0.0004,3000,1.4)
```

ExposureCurveSlicedLNormPareto *Exposure Curve from a Sliced LogNormal Pareto severity distribution*

Description

Exposure Curve from a Sliced LogNormal Pareto severity distribution

Usage

```
ExposureCurveSlicedLNormPareto(x, mu, sigma, SlicePoint, shape)
```

Arguments

x	A positive real number - the claim amount where the exposure curve will be evaluated.
mu	A real number - the first parameter of the attritional Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the attritional Claim Severity's LogNormal distribution.
SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The value of the Exposure curve at x with an attritional claim LogNormal distribution with parameters mu and sigma and a large claim Pareto distribution with parameters SlicePoint and shape.

Examples

```
ExposureCurveSlicedLNormPareto(1200,6,1.5,1000,1.2)
ExposureCurveSlicedLNormPareto(4000,7,1.6,3000,1.4)
```

GammaCappedMean *Gamma capped mean*

Description

Gamma capped mean

Usage

```
GammaCappedMean(cap, shape, rate)
```

Arguments

cap	A positive real number - the claim severity cap.
shape	A positive real number - the shape parameter of the Claim Severity's Gamma distribution.
rate	A positive real number - the rate parameter of the Claim Severity's Gamma distribution.

Value

The mean of the claim severity capped at cap with a Gamma distribution with parameters shape and rate.

Examples

```
GammaCappedMean(700,1,0.0005)
GammaCappedMean(1000,1.5,0.0006)
```

IGamma *Lower incomplete gamma function*

Description

Lower incomplete gamma function

Usage

```
IGamma(a, x)
```

Arguments

a	A positive real number.
x	A positive real number.

Value

The value of the lower incomplete gamma function at x with shape parameter a.

Examples

```
IGamma(1,1)
IGamma(0.1,2)
```

ILFGamma *Increased Limit Factor Curve from a Gamma severity distribution*

Description

Increased Limit Factor Curve from a Gamma severity distribution

Usage

```
ILFGamma(xLow, xHigh, shape, rate)
```

Arguments

xLow	A positive real number - the claim amount where the Increased Limit Factor Curve will be evaluated from.
xHigh	A positive real number - the claim amount where the Increased Limit Factor Curve will be evaluated to.
shape	A positive real number - the shape parameter of the Claim Severity's Gamma distribution.
rate	A positive real number - the rate parameter of the Claim Severity's Gamma distribution.

Value

The value of the Increased Limit Factor curve from xLow to xHigh with Claim Severity from a Gamma distribution with parameters shape and rate.

Examples

```
ILFGamma(1000,700,1,0.0005)
ILFGamma(1200,1000,1.5,0.0006)
```

ILFLNorm *Increased Limit Factor Curve from a LogNormal severity distribution*

Description

Increased Limit Factor Curve from a LogNormal severity distribution

Usage

```
ILFLNorm(xLow, xHigh, mu, sigma)
```

Arguments

xLow	A positive real number - the claim amount where the Increased Limit Factor Curve will be evaluated from.
xHigh	A positive real number - the claim amount where the Increased Limit Factor Curve will be evaluated to.
mu	A real number - the first parameter of the Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the Claim Severity's LogNormal distribution.

Value

The value of the Increased Limit Factor curve from xLow to xHigh with Claim Severity from a LogNormal distribution with parameters mu and sigma.

Examples

```
ILFLNorm(1000,2000,6,1.5)
ILFLNorm(1000,1500,5,1.6)
```

ILFPareto *Increased Limit Factor Curve from a Pareto severity distribution*

Description

Increased Limit Factor Curve from a Pareto severity distribution

Usage

```
ILFPareto(xLow, xHigh, scale, shape)
```

Arguments

xLow	A positive real number - the claim amount where the Increased Limit Factor Curve will be evaluated from.
xHigh	A positive real number - the claim amount where the Increased Limit Factor Curve will be evaluated to.
scale	A positive real number - the scale parameter of the Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the Claim Severity's Pareto distribution.

Value

The value of the Increased Limit Factor curve from xLow to xHigh with Claim Severity from a Pareto distribution with parameters scale and shape.

Examples

```
ILFPareto(700,1200,500,1.2)
ILFPareto(1200,20000,200,1.1)
```

`ILFSlicedGammaPareto` *Increased Limit Factor Curve from a Sliced Gamma Pareto severity distribution*

Description

Increased Limit Factor Curve from a Sliced Gamma Pareto severity distribution

Usage

```
ILFSlicedGammaPareto(xLow, xHigh, GShape, GRate, SlicePoint, PShape)
```

Arguments

`xLow`	A positive real number - the claim amount where the Limit Factor Curve will be evaluated from.
`xHigh`	A positive real number - the claim amount where the Limit Factor Curve will be evaluated to.
`GShape`	A positive real number - the shape parameter of the attritional Claim Severity's Gamma distribution.
`GRate`	A positive real number - the rate parameter of the attritional Claim Severity's Gamma distribution.
`SlicePoint`	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
`PShape`	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The value of the Increased Limit Factor curve from `xLow` to `xHigh` with an attritional claim Gamma distribution with parameters `GShape` and `GRate` and a large claim Pareto distribution with parameters `SlicePoint` and `PShape`.

Examples

```
ILFSlicedGammaPareto(2000,3000,1,0.0005,1000,1.2)
ILFSlicedGammaPareto(800,1000,1.1,0.0006,2000,1.6)
ILFSlicedGammaPareto(1200,2000,1.2,0.0004,3000,1.4)
```

ILFSlicedLNormPareto *Increased Limit Factor Curve from a Sliced LogNormal Pareto severity distribution*

Description

Increased Limit Factor Curve from a Sliced LogNormal Pareto severity distribution

Usage

```
ILFSlicedLNormPareto(xLow, xHigh, mu, sigma, SlicePoint, shape)
```

Arguments

xLow	A positive real number - the claim amount where the Limit Factor Curve will be evaluated from.
xHigh	A positive real number - the claim amount where the Limit Factor Curve will be evaluated to.
mu	A real number - the first parameter of the attritional Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the attritional Claim Severity's LogNormal distribution.
SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The value of the Increased Limit Factor curve from xLow to xHigh with an attritional claim LogNormal distribution with parameters mu and sigma and a large claim Pareto distribution with parameters SlicePoint and shape.

Examples

```
ILFSlicedLNormPareto(800,1200,6,1.5,1000,1.2)
ILFSlicedLNormPareto(2000,4000,7,1.6,3000,1.4)
```

LNormCappedMean *Lognormal capped mean*

Description

Lognormal capped mean

Usage

```
LNormCappedMean(cap, mu, sigma)
```

Arguments

cap	A positive real number - the claim severity cap.
mu	A real number - the first parameter of the Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the Claim Severity's LogNormal distribution.

Value

The mean of the claim severity capped at cap with a LogNormal distribution with parameters mu and sigma.

Examples

```
LNormCappedMean(2000,6,1.5)
LNormCappedMean(1000,5,1.6)
```

NetSimR *NetSimR: A non-life insurance package for computating various statistics.*

Description

The NetSimR package provides three categories of functions:

1. Capped means, Exposure and ILF curve from various severity distributions
2. Pure IBNR and UPR earned periods
3. Sliced distributions

NetSimR mean functions

SlicedGammaParetoMean SlicedLNormParetoMean

NetSimR capped mean functions

GammaCappedMean LNormCappedMean ParetoCappedMean SlicedGammaParetoCappedMean SlicedLNormParetoCappedMe

NetSimR exposure curve functions

ExposureCurveGamma ExposureCurveLNorm ExposureCurvePareto ExposureCurveSlicedGammaPareto ExposureCurveSlicedLNormPareto

NetSimR ILF curve functions

ILFGamma ILFLNorm ILFPareto ILFSlicedGammaPareto ILFSlicedLNormPareto

NetSimR pure IBNR functions

PureIBNRGamma PureIBNRLNorm

NetSimR Sliced distribution functions

dSlicedGammaPareto dSlicedLNormPareto pSlicedGammaPareto pSlicedLNormPareto qSlicedGammaPareto qSlicedLNormPareto

---

ParetoCappedMean *Pareto capped mean*

Description

Pareto capped mean

Usage

```
ParetoCappedMean(cap, scale, shape)
```

Arguments

cap	A positive real number - the claim severity cap.
scale	A positive real number - the scale parameter of the Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the Claim Severity's Pareto distribution.

Value

The mean of the claim severity capped at cap with a Pareto distribution with parameters scale and shape.

Examples

```
ParetoCappedMean(600,200,1.2)
ParetoCappedMean(800,100,1)
ParetoCappedMean(1000,500,0.8)
```

ParetoCappedMeanCalc *Pareto capped mean intermediary calculation*

Description

Pareto capped mean intermediary calculation

Usage

```
ParetoCappedMeanCalc(cap, scale, shape)
```

Arguments

cap	A positive real number - the claim severity cap.
scale	A positive real number - the scale parameter of the Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the Claim Severity's Pareto distribution.

Value

An interim calculation for the mean of the claim severity capped at cap with a Pareto distribution with parameters scale and shape.

Examples

```
ParetoCappedMeanCalc(800,100,1.1)
ParetoCappedMeanCalc(1000,500,0.9)
```

---

pSlicedGammaPareto *The cumulative density function (cdf) of a Sliced Gamma-Pareto severity distribution*

Description

The cumulative density function (cdf) of a Sliced Gamma-Pareto severity distribution

Usage

```
pSlicedGammaPareto(x, GShape, GRate, SlicePoint, PShape)
```

Arguments

x	A positive real number - the claim amount where the cumulative density function (cdf) will be evaluated.
GShape	A positive real number - the shape parameter of the attritional Claim Severity's Gamma distribution.
GRate	A positive real number - the rate parameter of the attritional Claim Severity's Gamma distribution.
SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
PShape	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The value of the cumulative density function (cdf) at x with an attritional claim Gamma distribution with parameters GShape and GRate and a large claim Pareto distribution with parameters SlicePoint and PShape.

Examples

```
pSlicedGammaPareto(3000,1,0.0005,1000,1.2)
pSlicedGammaPareto(1000,1.1,0.0006,2000,1.6)
pSlicedGammaPareto(2000,1.2,0.0004,3000,1.4)
```

---

pSlicedLNormPareto *The cumulative density function (cdf) of a Sliced LogNormal Pareto severity distribution*

Description

The cumulative density function (cdf) of a Sliced LogNormal Pareto severity distribution

Usage

```
pSlicedLNormPareto(x, mu, sigma, SlicePoint, shape)
```

Arguments

x	A positive real number - the claim amount where the cumulative density function (cdf) will be evaluated.
mu	A real number - the first parameter of the attritional Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the attritional Claim Severity's LogNormal distribution.

SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The value of the cumulative density function (cdf) at x with an attritional claim LogNormal distribution with parameters mu and sigma and a large claim Pareto distribution with parameters SlicePoint and shape.

Examples

```
pSlicedLNormPareto(1200,6,1.5,1000,1.2)
pSlicedLNormPareto(4000,7,1.6,3000,1.4)
```

PureIBNRGamma *Pure IBNR exposure from a Gamma reporting delay distribution*

Description

Pure IBNR exposure from a Gamma reporting delay distribution

Usage

```
PureIBNRGamma(IncDate, ExpDate, ValDate, shape, rate)
```

Arguments

IncDate	A date - the inception date of the period.
ExpDate	A date - the expiry date of the period. Must be greater than inception date.
ValDate	A date - the valuation date.
shape	A positive real number - the shape parameter of the reporing delay's Gamma distribution.
rate	A positive real number - the rate parameter of the reporing delay's Gamma distribution.

Value

Unearned and Pure IBNR exposure in days and as a percentage of the period's duration, where the reporting delay has a Gamma distribution with parameters shape and rate.

Examples

```
Dates = data.frame(
    inceptionDate = c("01/01/2006", "01/07/2006", "01/01/2007")
    ,expiryDate = c("31/12/2006", "30/06/2007", "31/12/2007")
)

Dates$inceptionDate<-as.POSIXct(Dates$inceptionDate, format="%d/%m/%Y")

Dates$expiryDate<-as.POSIXct(Dates$expiryDate, format="%d/%m/%Y")

ValuationDate<-as.POSIXct("30/10/2007", format="%d/%m/%Y")

PureIBNRGamma(Dates$inceptionDate,Dates$expiryDate,ValuationDate,7,0.15)
```

`PureIBNRLNorm` *Pure IBNR exposure from a LogNormal reporting delay distribution*

Description

Pure IBNR exposure from a LogNormal reporting delay distribution

Usage

```
PureIBNRLNorm(IncDate, ExpDate, ValDate, mu, sigma)
```

Arguments

`IncDate`	A date - the inception date of the period.
`ExpDate`	A date - the expiry date of the period. Must be greater than inception date.
`ValDate`	A date - the valuation date.
`mu`	A real number - the first parameter of the reporing delay's LogNormal distribution.
`sigma`	A positive real number - the second parameter of the reporing delay's LogNormal distribution.

Value

Unearned and Pure IBNR exposure in days and as a percentage of the period's duration, where the reporting delay has a LogNormal distribution with parameters `mu` and `sigma`.

Examples

```
Dates = data.frame(
    inceptionDate = c("01/01/2006", "01/07/2006", "01/01/2007")
    ,expiryDate = c("31/12/2006", "30/06/2007", "31/12/2007")
)
```

```
Dates$inceptionDate<-as.POSIXct(Dates$inceptionDate, format="%d/%m/%Y")

Dates$expiryDate<-as.POSIXct(Dates$expiryDate, format="%d/%m/%Y")

ValuationDate<-as.POSIXct("30/10/2007", format="%d/%m/%Y")

PureIBNRLNorm(Dates$inceptionDate,Dates$expiryDate,ValuationDate,4,1.5)
```

`qSlicedGammaPareto` *The inverse cumulative density function of a Sliced Gamma Pareto severity distribution*

Description

The inverse cumulative density function of a Sliced Gamma Pareto severity distribution

Usage

```
qSlicedGammaPareto(q, GShape, GRate, SlicePoint, PShape)
```

Arguments

`q`	A real number between 0 and 1 - the probability where the inverse cumulative density function will be evaluated.
`GShape`	A positive real number - the shape parameter of the attritional Claim Severity's Gamma distribution.
`GRate`	A positive real number - the rate parameter of the attritional Claim Severity's Gamma distribution.
`SlicePoint`	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
`PShape`	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The value of the inverse cumulative density function at `q` with an attritional claim Gamma distribution with parameters `GShape` and `GRate` and a large claim Pareto distribution with parameters `SlicePoint` and `PShape`.

Examples

```
qSlicedGammaPareto(0.5,1,0.0005,1000,1.2)
qSlicedGammaPareto(0.2,1.1,0.0006,2000,1.6)
qSlicedGammaPareto(0.8,1.2,0.0004,3000,1.4)
```

`qSlicedLNormPareto` *The inverse cumulative density function of a Sliced LogNormal Pareto severity distribution*

Description

The inverse cumulative density function of a Sliced LogNormal Pareto severity distribution

Usage

```
qSlicedLNormPareto(q, mu, sigma, SlicePoint, shape)
```

Arguments

`q`	A real number between 0 and 1 - the probability where the inverse cumulative density function will be evaluated.
`mu`	A real number - the first parameter of the attritional Claim Severity's LogNormal distribution.
`sigma`	A positive real number - the second parameter of the attritional Claim Severity's LogNormal distribution.
`SlicePoint`	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
`shape`	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The value of the inverse cumulative density function at `q` with an attritional claim LogNormal distribution with parameters `mu` and `sigma` and a large claim Pareto distribution with parameters `SlicePoint` and `shape`.

Examples

```
qSlicedLNormPareto(0.5,6,1.5,1000,1.2)
qSlicedLNormPareto(0.7,7,1.6,3000,1.4)
```

SlicedGammaParetoCappedMean
Sliced Gamma Pareto capped mean

Description

Sliced Gamma Pareto capped mean

Usage

```
SlicedGammaParetoCappedMean(cap, GShape, GRate, SlicePoint, PShape)
```

Arguments

cap	A positive real number - the claim severity cap.
GShape	A positive real number - the shape parameter of the attritional Claim Severity's Gamma distribution.
GRate	A positive real number - the rate parameter of the attritional Claim Severity's Gamma distribution.
SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
PShape	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The mean of the claim severity capped at cap with an attritional claim Gamma distribution with parameters GShape and GRate and a large claim Pareto distribution with parameters SlicePoint and PShape.

Examples

```
SlicedGammaParetoCappedMean(3000,1,0.0005,1000,1.2)
SlicedGammaParetoCappedMean(1000,1.1,0.0006,2000,1.6)
SlicedGammaParetoCappedMean(2000,1.2,0.0004,3000,1.4)
```

SlicedGammaParetoMean *Sliced Gamma Pareto mean*

Description

Sliced Gamma Pareto mean

Usage

```
SlicedGammaParetoMean(GShape, GRate, SlicePoint, PShape)
```

Arguments

GShape	A positive real number - the shape parameter of the attritional Claim Severity's Gamma distribution.
GRate	A positive real number - the rate parameter of the attritional Claim Severity's Gamma distribution.
SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
PShape	A positive real number - the Shape parameter of the tail Claim Severity's Pareto distribution.

Value

The mean of the claim severity with an attritional claim Gamma distribution with parameters GShape and GRate and a large claim Pareto distribution with parameters SlicePoint and PShape.

Examples

```
SlicedGammaParetoMean(1,0.0005,1000,1.2)
SlicedGammaParetoMean(1.1,0.0006,2000,1.6)
SlicedGammaParetoMean(1.2,0.0004,3000,1.4)
```

SlicedLNormParetoCappedMean *Sliced LogNormal Pareto capped mean*

Description

Sliced LogNormal Pareto capped mean

Usage

```
SlicedLNormParetoCappedMean(cap, mu, sigma, SlicePoint, shape)
```

Arguments

cap	A positive real number - the claim severity cap.
mu	A real number - the first parameter of the attritional Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the attritional Claim Severity's LogNormal distribution.
SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The mean of the claim severity capped at cap with an attritional claim LogNormal distribution with parameters mu and sigma and a large claim Pareto distribution with parameters SlicePoint and shape.

Examples

```
SlicedLNormParetoCappedMean(1200,6,1.5,1000,1.2)
SlicedLNormParetoCappedMean(2500,6.5,1.4,2000,1.6)
SlicedLNormParetoCappedMean(4000,7,1.6,3000,1.4)
```

SlicedLNormParetoMean *Sliced LogNormal Pareto mean*

Description

Sliced LogNormal Pareto mean

Usage

```
SlicedLNormParetoMean(mu, sigma, SlicePoint, shape)
```

Arguments

mu	A real number - the first parameter of the attritional Claim Severity's LogNormal distribution.
sigma	A positive real number - the second parameter of the attritional Claim Severity's LogNormal distribution.
SlicePoint	A positive real number - the slice point and the scale parameter of the tail Claim Severity's Pareto distribution.
shape	A positive real number - the shape parameter of the tail Claim Severity's Pareto distribution.

Value

The mean of the claim severity with an attritional claim LogNormal distribution with parameters `mu` and `sigma` and a large claim Pareto distribution with parameters `SlicePoint` and `shape`.

Examples

```
SlicedLNormParetoMean(6,1.5,1000,1.2)
SlicedLNormParetoMean(6.5,1.4,2000,1.6)
SlicedLNormParetoMean(7,1.6,3000,1.4)
```

Index

dSlicedGammaPareto, 2, *15*
dSlicedLNormPareto, 3, *15*

erf, 4
ExposureCurveGamma, 5, *15*
ExposureCurveLNorm, 5, *15*
ExposureCurvePareto, 6, *15*
ExposureCurveSlicedGammaPareto, 7, *15*
ExposureCurveSlicedLNormPareto, 8, *15*

GammaCappedMean, 8, *15*

IGamma, 9
ILFGamma, 10, *15*
ILFLNorm, 10, *15*
ILFPareto, 11, *15*
ILFSlicedGammaPareto, 12, *15*
ILFSlicedLNormPareto, 13, *15*

LNormCappedMean, 14, *15*

NetSimR, 14

ParetoCappedMean, *15*, 15
ParetoCappedMeanCalc, 16
pSlicedGammaPareto, *15*, 16
pSlicedLNormPareto, *15*, 17
PureIBNRGamma, *15*, 18
PureIBNRLNorm, *15*, 19

qSlicedGammaPareto, *15*, 20
qSlicedLNormPareto, *15*, 21

SlicedGammaParetoCappedMean, *15*, 22
SlicedGammaParetoMean, *14*, 23
SlicedLNormParetoCappedMean, *15*, 23
SlicedLNormParetoMean, *14*, 24