

# Package ‘dhh’

October 13, 2022

**Title** A Heavy-Headed Distribution

**Version** 0.0.1

**Description** The density, cumulative distribution, quantiles,  
and i.i.d random variables of a heavy-headed distribution.  
For more information, please see the vignette.

**Depends** R (>= 3.5.0)

**License** GPL (>= 2)

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.0.1

**Suggests** knitr, rmarkdown

**VignetteBuilder** knitr

**NeedsCompilation** no

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**Repository** CRAN

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dhh

*Density Function Of The Heavy-Headed Distribution*

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### Description

This function gives the values of the density of the heavy-headed distribution.

### Usage

```
dhh(x, a=0, b=1, alpha=0.1)
```

### Arguments

x	x is a vector of real values, at which the values of the density will be calculated.
a,b	The interval (a,b) is the support of the distribution. The default values for a and b are 0 and 1, respectively.
alpha	It is a positive parameter of the distribution. Its default value is set to be 0.1. When alpha = 1, the distribution is uniform. When alpha > 1, the density at a is zero.

### Details

See the references.

### Value

It returns the values of the density at x.

### Author(s)

Runlong Tang

### References

Runlong Tang (2018) A Note On Finite Moments, Rediscovery Of The Pareto Distribution and Distributions With Heavy Tails and Heads (v1) <https://sites.google.com/site/tangrunlong/notes-on-finance>

### See Also

[phh](#) [qhh](#) [rhh](#)

**Examples**

```

dhh(0.5)

dhh(0.5, 0, 1, 0.1)

dhh(c(0.5, 0.7))

curve(dhh, -1, 2)

curve(dhh(x, a=0, b=1, alpha=0.1), -1, 2)

curve(dhh(x, a=0, b=10, alpha=0.1), -1, 11)

```

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phh	<i>Cumulative Distribution Function (CDF) Of The Heavy-Headed Distribution</i>
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**Description**

This function gives the values of the CDF of the heavy-headed distribution.

**Usage**

```
phh(x, a = 0, b = 1, alpha = 0.1)
```

**Arguments**

x	x is a vector of real values, at which the values of the CDF will be calculated.
a,b	The interval (a,b) is the support of the distribution. The default values for a and b are 0 and 1, respectively.
alpha	It is a positive parameter of the distribution. Its default value is set to be 0.1. When alpha = 1, the distribution is uniform. When alpha > 1, the density at a is zero.

**Details**

See the references.

**Value**

It returns the values of the CDF at x.

**Author(s)**

Runlong Tang

**References**

Runlong Tang (2018) A Note On Finite Moments, Rediscovery Of The Pareto Distribution and Distributions With Heavy Tails and Heads (v1) <https://sites.google.com/site/tangrunlong/notes-on-finance>

**See Also**

[dhh](#) [qhh](#) [rhh](#)

**Examples**

```
phh(0)
```

```
phh(1)
```

```
phh(0.5)
```

```
phh(0.5, 0, 1, 0.1)
```

```
phh(c(0.5, 0.7))
```

```
curve(phh, from = -1, to = 2)
```

```
curve(phh(x, a=0, b=1, alpha=0.1), -1, 2)
```

```
curve(phh(x, a=0, b=10, alpha=0.1), -1, 11)
```

```
curve(phh(x, a=0, b=100, alpha=0.1), -1, 11)
```

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qhh

*Quantiles of Of The Heavy-Headed Distribution*

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**Description**

This function gives the quantiles of the heavy-headed distribution.

**Usage**

```
qhh(p, a = 0, b = 1, alpha = 0.1)
```

**Arguments**

p	p is a vector of probabilities, at which the quantiles of the CDF will be calculated.
a,b	The interval (a,b) is the support of the distribution. The default values for a and b are 0 and 1, respectively.
alpha	It is a positive parameter of the distribution. Its default value is set to be 0.1. When alpha = 1, the distribution is uniform. When alpha > 1, the density at a is zero.

**Details**

See the references.

**Value**

It returns the quantiles of the CDF at p.

**Author(s)**

Runlong Tang

**References**

Runlong Tang (2018) A Note On Finite Moments, Rediscovery Of The Pareto Distribution and Distributions With Heavy Tails and Heads (v1) <https://sites.google.com/site/tangrunlong/notes-on-finance>

**See Also**

[dhh](#) [pjh](#) [rhh](#)

**Examples**

```
qhh(0.9)
```

```
qhh(0.9, a=0, b=1, alpha=0.1)
```

```
qhh(0.9, a=0, b=10, alpha=0.1)
```

```
qhh((1:9)/10)
```

```
curve(qhh, from = 0.1, to = 0.9)
```

```
curve(qhh(x, 0, 1, 0.1), from = 0.1, to = 0.9)
```

```
curve(qhh(x, a=10, b=100, alpha = 0.1), from = 0.1, to = 0.9)
```

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rhh

*Random Variables of Of The Heavy-Headed Distribution*

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**Description**

This function generate i.i.d. random variables following the heavy-headed distribution.

**Usage**

```
rhh(n, a = 0, b = 1, alpha = 0.1)
```

**Arguments**

n	It is the number of the random variables.
a,b	The interval (a,b) is the support of the distribution. The default values for a and b are 0 and 1, respectively.
alpha	It is a positive parameter of the distribution. Its default value is set to be 0.1. When alpha = 1, the distribution is uniform. When alpha > 1, the density at a is zero.

**Details**

See the references.

**Value**

It returns a vector of n random variables following the heavy-headed distribution.

**Author(s)**

Runlong Tang

**References**

Runlong Tang (2018) A Note On Finite Moments, Rediscovery Of The Pareto Distribution and Distributions With Heavy Tails and Heads (v1) <https://sites.google.com/site/tangrunlong/notes-on-finance>

**See Also**

[dhh](#) [phh](#) [qhh](#)

**Examples**

```
rhh(1)
rhh(2)
hist(rhh(10000), freq=FALSE)
curve(dhh, add = TRUE, col = 2)
dhh(c(0.1, 0.01, 0.001, 0.0001, 0.00001))
```

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