

# Package ‘stodom’

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**Title** Estimating Consistent Tests for Stochastic Dominance

**Version** 0.0.1

**Description** Stochastic dominance tests help ranking different distributions. The package implements the consistent test for stochastic dominance by Barrett and Donald (2003) <[doi:10.1111/1468-0262.00390](https://doi.org/10.1111/1468-0262.00390)>. Specifically, it implements Barrett and Donald's Kolmogorov-Smirnov type tests for first- and second-order stochastic dominance based on bootstrapping 2 and 1.

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**Encoding** UTF-8

**RoxygenNote** 7.2.3

**Imports** dplyr, tibble, ggplot2, pracma, tidyr

**Suggests** testthat

**NeedsCompilation** no

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**Repository** CRAN

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dif_ecdf_plot	<i>plot difference ecdfs</i>
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### Description

This function computes the values of the cumulative difference of two empirical cumulative distribution function and plots the values.

### Usage

```
dif_ecdf_plot(data_1, data_2, bins_size)
```

### Arguments

data_1	data 1.
data_2	data 2.
bins_size	bin size.

### Details

This function computes the values of the cumulative difference of two empirical cumulative distribution function and plots the values. This relates two showing second-order stochastic dominance.

### Value

The function returns a plot as a ggplot2 object.

### Examples

```
# load stodom
require(stodom)

data_a <- rnorm(500, 3, 2)
data_b <- rnorm(500, 1, 2)

# plot cumulative difference between two ecdfs
dif_ecdf_plot(data_1 = data_a, data_2 = data_b, bins_size = 0.1)
```

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ecdf_dat_g	<i>values of two ecdf and their cumulative difference</i>
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### Description

This function computes the values of two empirical cumulative distribution function as well as their cumulative differences.

### Usage

```
ecdf_dat_g(data_1, data_2, bins_size)
```

### Arguments

data_1	data 1.
data_2	data 2.
bins_size	bin size.

### Details

This function computes the values of two empirical cumulative distribution function as well as their cumulative differences.

### Value

The function returns a data table.

### Examples

```
# load stodom
require(stodom)

data_a <- rnorm(500, 3, 2)
data_b <- rnorm(500, 1, 2)

# compute the values of two ecdfs and their cumulative differences.
ecdf_dat_g(data_1 = data_a, data_2 = data_b, bins_size = 1)
```

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`ecdf_plot`*plot ecdfs*

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### Description

This function computes the values of two empirical cumulative distribution function and plots the values.

### Usage

```
ecdf_plot(data_1, data_2, bins_size)
```

### Arguments

<code>data_1</code>	data 1.
<code>data_2</code>	data 2.
<code>bins_size</code>	bin size.

### Details

This function computes the values of two empirical cumulative distribution function and plots the values.

### Value

The function returns a plot as a `ggplot2` object.

### Examples

```
# load stodom
require(stodom)

data_a <- rnorm(500, 3, 2)
data_b <- rnorm(500, 1, 2)

# plot ecdfs
ecdf_plot(data_1 = data_a, data_2 = data_b, bins_size = 0.1)
```

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fo_stodom	<i>first-order stochastic dominance test</i>
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### Description

This function tests for first-order stochastic dominance.

### Usage

```
fo_stodom(data_1, data_2, bins_size, n_draws, useed, variable_1, variable_2, type)
```

### Arguments

data_1	data 1.
data_2	data 2.
bins_size	bin size.
n_draws	number of draws to compute p values (default = 500).
useed	user defined seed
variable_1	name of a (as a string); only for the output table (default = "a").
variable_2	name of b (as a string); only for the output table (default = "b").
type	type of bootstrapped test, bootstrapping 1 and 2 of Barrett and Donald (2003) are available (default = "boot2").

### Details

This function computes the consistent test of first-order stochastic dominance following Barrett and Donald (2003). In detail, this function estimate their Kolmogorov-Smirnov type tests based on bootstrapping 2. The function was implemented as part of Schaub xxx

### Value

The function returns a list object containing the p-values of two dominance tests (i.e., variable 1 vs. variable 1 and variable 2 vs. variable 1).

### References

Barrett, G. F., & Donald, S. G. (2003). Consistent tests for stochastic dominance. *Econometrica*, 71(1), 71-104.

Schaub, S. & El Benni, N. (2024). How do price (risk) changes influence farmers' preference to reduce fertilizer application?

## Examples

```
# load stodom
require(stodom)

data_a <- rnorm(500, 3, 2)
data_b <- rnorm(500, 1, 2)

# estimate first-order stochastic dominance
fo_stodom(data_1 = data_a, data_2 = data_b, n_draws = 100, useed = 1, bins_size = 1)
```

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so_stodom	<i>second-order stochastic dominance test</i>
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## Description

This function tests for second-order stochastic dominance.

## Usage

```
so_stodom(data_1, data_2, bins_size, n_draws, useed, variable_1, variable_2, type)
```

## Arguments

data_1	data 1.
data_2	data 2.
bins_size	bin size.
n_draws	number of draws to compute p values (default = 500).
useed	user defined seed
variable_1	name of a (as a string); only for the output table (default = "a").
variable_2	name of b (as a string); only for the output table (default = "b").
type	type of bootstrapped test, bootstrapping 1 and 2 of Barrett and Donald (2003) are available (default = "boot2").

## Details

This function computes the consistent test of second-order stochastic dominance following Barrett and Donald (2003). In detail, this function estimate their Kolmogorov-Smirnov type tests based on bootstrapping 2. The function was implemented as part of Schaub xxx

## Value

The function returns a list object containing the p-values of two dominance tests (i.e., variable 1 vs. variable 1 and variable 2 vs. variable 1).

**References**

Barrett, G. F., & Donald, S. G. (2003). Consistent tests for stochastic dominance. *Econometrica*, 71(1), 71-104.

Schaub, S. & El Benni, N. (2024). How do price (risk) changes influence farmers' preference to reduce fertilizer application?

**Examples**

```
# load stodom
require(stodom)

data_a <- rnorm(500, 3, 2)
data_b <- rnorm(500, 1, 2)

# estimate second-order stochastic dominance
so_stodom(data_1 = data_a, data_2 = data_b, n_draws = 100, useed = 1, bins_size = 1)
```

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