

# Package ‘Rtauchen’

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**Type** Package

**Title** Discretization of AR(1) Processes

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**URL** <https://github.com/davidzarruk/Rtauchen>

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**Description** Discretize AR(1) process following Tauchen (1986) <<http://www.sciencedirect.com/science/article/pii/0165176586901680>>. A discrete Markov chain that approximates in the sense of weak convergence a continuous-valued univariate Autoregressive process of first order is generated. It is a popular method used in economics and in finance.

**License** GPL (>= 2)

**Imports** stats

**NeedsCompilation** no

**Repository** CRAN

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Rtauchen

*Rtauchen*

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**Description**

This function generates a matrix of transition probabilities of a finite-state Markov chain that mimics an AR(1) process with persistence parameter  $\lambda$ , standard deviation  $\sigma$  and a fixed parameter  $m$ .

**Usage**

```
Rtauchen(ne, sigma_eps, lambda_eps, m)
```

**Arguments**

ne	Number of points of the grid of the finite-state Markov chain that mimics the AR(1) process
sigma_eps	Standard deviation of exogenous shock in the AR(1) process
lambda_eps	Persistence parameter of the AR(1) process
m	Tauchen parameter for the width of the process (number of standard deviations of the AR(1) process covered by the grid)

**Details**

See Tauchen (1986) for details.

**Value**

A matrix with the corresponding to the transition matrix of the finite-state Markov chain that approximates the AR(1) process

**Examples**

```
results = Rtauchen(2, 1.0e-5, 0.1,0.4)
results
```

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Tgrid

*Tgrid*

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### Description

This function generates a grid of a finite-state Markov chain that mimics an AR(1) process with persistence parameter  $\lambda$ , standard deviation  $\sigma$  and a fixed parameter  $m$ .

### Usage

```
Tgrid(ne, sigma_eps, lambda_eps, m)
```

### Arguments

ne	Number of points of the grid of the finite-state Markov chain that mimics the AR(1) process
sigma_eps	Standard deviation of exogenous shock in the AR(1) process
lambda_eps	Persistence parameter of the AR(1) process
m	Tauchen parameter for the width of the process (number of standard deviations of the AR(1) process covered by the grid)

### Details

See Tauchen (1986) for details.

### Value

An array with the grid points of a finite-state Markov chain which approximates the original AR(1) process.

### Examples

```
results = Tgrid(5, 0.02, 0.98, 3)
```

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