Package 'metaVAR'

June 17, 2024

Title Multivariate Meta-Analysis of Vector Autoregressive Model Coefficients

Version 0.9.1

Description Estimates the mean vector and covariance matrix of the multivariate meta-analysis of vector autoregressive model coefficients.

URL https://github.com/jeksterslab/metaVAR,

https://jeksterslab.github.io/metaVAR/

BugReports https://github.com/jeksterslab/metaVAR/issues

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Encoding UTF-8

Roxygen list(markdown = TRUE)

Depends R (>= 3.5.0), OpenMx

Imports numDeriv, Matrix

Suggests knitr, rmarkdown, testthat, simStateSpace

RoxygenNote 7.3.1

NeedsCompilation no

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Contents

FitDTVAR　　　　　　　　*Fit First Order Discrete-Time Vector Autoregressive Model by ID*

Description

Fit First Order Discrete-Time Vector Autoregressive Model by ID

Usage

```
FitDTVAR(
  data,
  observed,
  id,
  beta_start = NULL,
  beta_lbound = NULL,
  beta_ubound = NULL,
  psi_start = NULL,
  psi_lbound = NULL,
  psi_ubound = NULL,
  try = 100,
  ncores = NULL
)
```

Arguments

data	Data frame. A data frame object of data for potentially multiple subjects that contain a column of subject ID numbers (i.e., an ID variable), and at least one column of observed values.
observed	Character vector. A vector of character strings of the names of the observed variables in the data.
id	Character string. A character string of the name of the ID variable in the data.
beta_start	Optional starting values for beta.
beta_lbound	Optional lower bound for beta.
beta_ubound	Optional upper bound for beta.
psi_start	Optional starting values for psi.
psi_lbound	Optional lower bound for psi.
psi_ubound	Optional upper bound for psi.
try	Positive integer. Number of extra tries for OpenMx::mxTryHard().
ncores	Positive integer. Number of cores to use.

Author(s)

Ivan Jacob Agaloos Pesigan

See Also

Other Meta-Analysis of VAR Functions: Meta()

Meta   *Fit Multivariate Meta-Analysis*

Description

This function estimates the mean and covariance matrix of a vector of coefficients using the estimated coefficients and sampling variance-covariance matrix from each individual.

Usage

```
Meta(object, mu_start = NULL, sigma_l_start = NULL, try = 1000, ncores = NULL)
```

Arguments

object	Object of class metavardtvar, that is, the output of FitDTVAR().
mu_start	Numeric matrix. Matrix of starting values of mu.
sigma_l_start	Numeric matrix. Matrix of starting values of t(chol(sigma)).
try	Positive integer. Number of extra tries for OpenMx::mxTryHard().
ncores	Positive integer. Number of cores to use.

Details

For $i = \{1, \cdots, n\}$, the objective function used to estimate the mean $\boldsymbol{\mu}$ and covariance matrix $\boldsymbol{\Sigma}$ of the random coefficients $\mathbf{y}_i$ is given by

$$\ell\left(\boldsymbol{\mu}, \boldsymbol{\Sigma} \mid \mathbf{y}_i, \mathbb{V}\left(\mathbf{y}_i\right)\right) = -\frac{1}{2}\left[q\log\left(2\pi\right) + \log\left(\left|\mathbb{V}\left(\mathbf{y}_i\right) - \boldsymbol{\Sigma}\right|\right) + \left(\mathbf{y}_i - \boldsymbol{\mu}\right)'\left(\mathbb{V}\left(\mathbf{y}_i\right) - \boldsymbol{\Sigma}\right)^{-1}\left(\mathbf{y}_i - \boldsymbol{\mu}\right)\right]$$

where q is the number of unique elements in $\boldsymbol{\mu}$ and $\boldsymbol{\Sigma}$, and $\mathbb{V}\left(\mathbf{y}_i\right)$ is the sampling variance-covariance matrix of $\mathbf{y}_i$.

Value

Returns an object of class metavarmeta which is a list with the following elements:

call Function call.

args Function arguments.

fun Function used ("Meta").

output Fitted model.

transform Transformed estimates.

Author(s)

Ivan Jacob Agaloos Pesigan

See Also

Other Meta-Analysis of VAR Functions: [FitDTVAR](#)()

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print.metavarmeta   *Print Method for Object of Class* metavarmeta

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Description

Print Method for Object of Class metavarmeta

Usage

```
## S3 method for class 'metavarmeta'
print(x, alpha = 0.05, digits = 4, ...)
```

Arguments

x	an object of class metavarmeta.
alpha	Numeric vector. Significance level α.
digits	Integer indicating the number of decimal places to display.
...	further arguments.

Author(s)

Ivan Jacob Agaloos Pesigan

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summary.metavarmeta   *Summary Method for Object of Class* metavarmeta

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Description

Summary Method for Object of Class metavarmeta

Usage

```
## S3 method for class 'metavarmeta'
summary(object, alpha = 0.05, digits = 4, ...)
```

Arguments

object	an object of class metavarmeta.
alpha	Numeric vector. Significance level α.
digits	Integer indicating the number of decimal places to display.
...	further arguments.

Author(s)

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