

Package ‘metaVAR’

July 5, 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, fitDTVARMx

Remotes jeksterslab/fitDTVARMx

Suggests knitr, rmarkdown, testthat, simStateSpace

RoxygenNote 7.3.2

NeedsCompilation no

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 coef.metavarmeta

Estimated Parameter Method for an Object of Class metavarmeta

Description

Estimated Parameter Method for an Object of Class metavarmeta

Usage

```
## S3 method for class 'metavarmeta'
coef(object, ...)
```

Arguments

object an object of class metavarmeta.
 ... further arguments.

Value

Returns a vector of the mean estimated parameters.

Author(s)

Ivan Jacob Agaloos Pesigan

 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(
  y,
  v,
  mu_start = NULL,
  mu_lbound = NULL,
  mu_ubound = NULL,
  sigma_l_start = NULL,
  sigma_l_lbound = NULL,
  sigma_l_ubound = NULL,
  try = 1000,
  ncores = NULL
)
```

Arguments

<code>y</code>	A list. Each element of the list is a numeric vector of estimated coefficients.
<code>v</code>	A list. Each element of the list is a sampling variance-covariance matrix of <code>y</code> .
<code>mu_start</code>	Numeric vector. Optional vector of starting values for <code>mu</code> .
<code>mu_lbound</code>	Numeric vector. Optional vector of lower bound values for <code>mu</code> .
<code>mu_ubound</code>	Numeric vector. Optional vector of upper bound values for <code>mu</code> .
<code>sigma_l_start</code>	Numeric matrix. Optional matrix of starting values for <code>t(chol(sigma))</code> .
<code>sigma_l_lbound</code>	Numeric matrix. Optional matrix of lower bound values for <code>t(chol(sigma))</code> .
<code>sigma_l_ubound</code>	Numeric matrix. Optional matrix of upper bound values for <code>t(chol(sigma))</code> .
<code>try</code>	Positive integer. Number of extra tries for <code>OpenMx::mxTryHard()</code> .
<code>ncores</code>	Positive integer. Number of cores to use.

Details

For $i = \{1, \dots, n\}$, 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

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

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

Author(s)

Ivan Jacob Agaloos Pesigan

See Also

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

MetaVAR

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

```
MetaVAR(
  object,
  mu_start = NULL,
  mu_lbound = NULL,
  mu_ubound = NULL,
  sigma_l_start = NULL,
  sigma_l_lbound = NULL,
  sigma_l_ubound = NULL,
  psi = FALSE,
  theta = FALSE,
  try = 1000,
  ncores = NULL
)
```

Arguments

object	Output of the <code>fitDTVARmx::FitDTVARIDmx()</code> function.
mu_start	Numeric vector. Optional vector of starting values for mu.
mu_lbound	Numeric vector. Optional vector of lower bound values for mu.
mu_ubound	Numeric vector. Optional vector of upper bound values for mu.
sigma_l_start	Numeric matrix. Optional matrix of starting values for $t(\text{chol}(\text{sigma}))$.
sigma_l_lbound	Numeric matrix. Optional matrix of lower bound values for $t(\text{chol}(\text{sigma}))$.
sigma_l_ubound	Numeric matrix. Optional matrix of upper bound values for $t(\text{chol}(\text{sigma}))$.
psi	Logical. If <code>psi = TRUE</code> , include estimates of the psi matrix. If <code>psi = FALSE</code> , exclude estimates of the psi matrix.
theta	Logical. If <code>theta = TRUE</code> , include estimates of the theta matrix if available. If <code>theta = FALSE</code> , exclude estimates of the theta matrix.
try	Positive integer. Number of extra tries for <code>OpenMx::mxTryHard()</code> .
ncores	Positive integer. Number of cores to use.

Details

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

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

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

Author(s)

Ivan Jacob Agaloos Pesigan

See Also

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

print.metavarmeta	<i>Print Method for Object of Class metavarmeta</i>
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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

summary.metavarmeta	<i>Summary Method for Object of Class metavarmeta</i>
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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)

Ivan Jacob Agaloos Pesigan

vcov.metavarmeta	<i>Variance-Covariance Matrix Method for an Object of Class metavarmeta</i>
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Description

Variance-Covariance Matrix Method for an Object of Class metavarmeta

Usage

```
## S3 method for class 'metavarmeta'  
vcov(object, ...)
```

Arguments

object	an object of class metavarmeta.
...	further arguments.

Value

Returns the variance-covariance matrix of the estimated parameters.

Author(s)

Ivan Jacob Agaloos Pesigan

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