

# Package ‘metaVAR’

July 3, 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>

**License** MIT + file LICENSE

**Encoding** UTF-8

**Roxygen** list(markdown = TRUE)

**Depends** R (>= 3.5.0), OpenMx

**Imports** numDeriv, Matrix

**Suggests** knitr, rmarkdown, testthat, simStateSpace

**RoxygenNote** 7.3.2

**NeedsCompilation** no

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coef.metavarmeta	<i>Estimated Parameter Method for an Object of Class metavarmeta</i>
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### 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

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Meta	<i>Fit Multivariate Meta-Analysis</i>
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### 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, sigma_l_start = NULL, try = 1000, ncores = NULL)
```

### Arguments

y	A list. Each element of the list is a numeric vector of estimated coefficients.
v	A list. Each element of the list is a sampling variance-covariance matrix of y.
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 <a href="#">OpenMx::mxTryHard()</a> .
ncores	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

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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 $\alpha$ .
digits	Integer indicating the number of decimal places to display.
...	further arguments.

**Author(s)**

Ivan Jacob Agaloos Pesigan

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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 $\alpha$ .
digits	Integer indicating the number of decimal places to display.
...	further arguments.

**Author(s)**

Ivan Jacob Agaloos Pesigan

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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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