

Package ‘metaVAR’

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Title Multivariate Meta-Analysis of Vector Autoregressive Model
Estimates

Version 0.0.0.9000

Description Fits fixed-, random-, or mixed-effects multivariate meta-analysis models
using vector autoregressive model estimates from each individual.

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 Matrix, fitDTVARMx

Remotes jeksterslab/fitDTVARMx

Suggests knitr, rmarkdown, testthat, simStateSpace

RoxygenNote 7.3.2

NeedsCompilation no

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Contents

| | |
|-------------------------------|----------|
| coef.metavarmeta | 2 |
| Meta | 2 |
| MetaVARMx | 4 |
| print.metavarmeta | 7 |
| summary.metavarmeta | 7 |
| vcov.metavarmeta | 8 |
| Index | 9 |

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

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 estimated parameters.

Author(s)

Ivan Jacob Agaloos Pesigan

| | |
|------|---------------------------------------|
| Meta | <i>Fit Multivariate Meta-Analysis</i> |
|------|---------------------------------------|

Description

This function estimates fixed-, random-, or mixed-effects meta-analysis parameters using the estimated coefficients and sampling variance-covariance matrix from each individual.

Usage

```
Meta(
  y,
  v,
  x = NULL,
  alpha_values = NULL,
  alpha_free = NULL,
  alpha_lbound = NULL,
  alpha_ubound = NULL,
  beta_values = NULL,
  beta_free = NULL,
```

```

    beta_lbound = NULL,
    beta_ubound = NULL,
    tau_values = NULL,
    tau_free = NULL,
    tau_lbound = NULL,
    tau_ubound = NULL,
    random = TRUE,
    diag = FALSE,
    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. |
| x | An optional list. Each element of the list is a numeric vector of covariates for the mixed-effects model. |
| alpha_values | Numeric vector. Optional vector of starting values for alpha. |
| alpha_free | Logical vector. Optional vector of free (TRUE) parameters for alpha. |
| alpha_lbound | Numeric vector. Optional vector of lower bound values for alpha. |
| alpha_ubound | Numeric vector. Optional vector of upper bound values for alpha. |
| beta_values | Numeric matrix. Optional matrix of starting values for beta. |
| beta_free | Logical matrix. Optional matrix of free (TRUE) parameters for beta. |
| beta_lbound | Numeric matrix. Optional matrix of lower bound values for beta. |
| beta_ubound | Numeric matrix. Optional matrix of upper bound values for beta. |
| tau_values | Numeric matrix. Optional matrix of starting values for $t(\text{chol}(\text{tau_sqr}))$. |
| tau_free | Numeric matrix. Optional matrix of free (TRUE) parameters for $t(\text{chol}(\text{tau_sqr}))$. |
| tau_lbound | Numeric matrix. Optional matrix of lower bound values for $t(\text{chol}(\text{tau_sqr}))$. |
| tau_ubound | Numeric matrix. Optional matrix of upper bound values for $t(\text{chol}(\text{tau_sqr}))$. |
| random | Logical. If random = TRUE, estimates random effects. If random = FALSE, tau_sqr is a null matrix. |
| diag | Logical. If diag = TRUE, tau_sqr is a diagonal matrix. If diag = FALSE, tau_sqr is a symmetric matrix. |
| try | Positive integer. Number of extra optimization tries. |
| ncores | Positive integer. Number of cores to use. |
| ... | Additional optional arguments to pass to <code>mTryHardctsem</code> . |

Author(s)

Ivan Jacob Agaloos Pesigan

References

Cheung, M. W.-L. (2015). *Meta-analysis: A structural equation modeling approach*. Wiley. doi:10.1002/9781118957813

Neale, M. C., Hunter, M. D., Pritikin, J. N., Zahery, M., Brick, T. R., Kirkpatrick, R. M., Estabrook, R., Bates, T. C., Maes, H. H., & Boker, S. M. (2015). OpenMx 2.0: Extended structural equation and statistical modeling. *Psychometrika*, 81(2), 535–549. doi:10.1007/s1133601494358

See Also

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

MetaVARMx

Fit Multivariate Meta-Analysis

Description

This function estimates fixed-, random-, or mixed-effects meta-analysis parameters using the estimated coefficients and sampling variance-covariance matrix from each individual fitted using the [fitDTVARMx::FitDTVARIDMx\(\)](#) function.

Usage

```
MetaVARMx(
  object,
  x = NULL,
  alpha_values = NULL,
  alpha_free = NULL,
  alpha_lbound = NULL,
  alpha_ubound = NULL,
  beta_values = NULL,
  beta_free = NULL,
  beta_lbound = NULL,
  beta_ubound = NULL,
  tau_values = NULL,
  tau_free = NULL,
  tau_lbound = NULL,
  tau_ubound = NULL,
  random = TRUE,
  diag = FALSE,
  intercept = FALSE,
  noise = FALSE,
  error = FALSE,
  try = 1000,
  ncores = NULL,
  ...
)
```

Arguments

| | |
|--------------|---|
| object | Output of the <code>fitDTVARMx::FitDTVARIDMx()</code> function. |
| x | An optional list. Each element of the list is a numeric vector of covariates for the mixed-effects model. |
| alpha_values | Numeric vector. Optional vector of starting values for alpha. |
| alpha_free | Logical vector. Optional vector of free (TRUE) parameters for alpha. |
| alpha_lbound | Numeric vector. Optional vector of lower bound values for alpha. |
| alpha_ubound | Numeric vector. Optional vector of upper bound values for alpha. |
| beta_values | Numeric matrix. Optional matrix of starting values for beta. |
| beta_free | Logical matrix. Optional matrix of free (TRUE) parameters for beta. |
| beta_lbound | Numeric matrix. Optional matrix of lower bound values for beta. |
| beta_ubound | Numeric matrix. Optional matrix of upper bound values for beta. |
| tau_values | Numeric matrix. Optional matrix of starting values for $t(\text{chol}(\text{tau_sqr}))$. |
| tau_free | Numeric matrix. Optional matrix of free (TRUE) parameters for $t(\text{chol}(\text{tau_sqr}))$. |
| tau_lbound | Numeric matrix. Optional matrix of lower bound values for $t(\text{chol}(\text{tau_sqr}))$. |
| tau_ubound | Numeric matrix. Optional matrix of upper bound values for $t(\text{chol}(\text{tau_sqr}))$. |
| random | Logical. If <code>random = TRUE</code> , estimates random effects. If <code>random = FALSE</code> , <code>tau_sqr</code> is a null matrix. |
| diag | Logical. If <code>diag = TRUE</code> , <code>tau_sqr</code> is a diagonal matrix. If <code>diag = FALSE</code> , <code>tau_sqr</code> is a symmetric matrix. |
| intercept | Logical. If <code>intercept = TRUE</code> , include estimates of the process intercept vector, if available. If <code>intercept = FALSE</code> , exclude estimates of the process intercept vector. |
| noise | Logical. If <code>noise = TRUE</code> , include estimates of the process noise matrix, if available. If <code>noise = FALSE</code> , exclude estimates of the process noise matrix. |
| error | Logical. If <code>error = TRUE</code> , include estimates of the measurement error matrix, if available. If <code>error = FALSE</code> , exclude estimates of the measurement error matrix. |
| try | Positive integer. Number of extra optimization tries. |
| ncores | Positive integer. Number of cores to use. |
| ... | Additional optional arguments to pass to <code>mxTryHardctsem</code> . |

Author(s)

Ivan Jacob Agaloos Pesigan

References

- Cheung, M. W.-L. (2015). *Meta-analysis: A structural equation modeling approach*. Wiley. doi:10.1002/9781118957813
- Neale, M. C., Hunter, M. D., Pritikin, J. N., Zahery, M., Brick, T. R., Kirkpatrick, R. M., Estabrook, R., Bates, T. C., Maes, H. H., & Boker, S. M. (2015). OpenMx 2.0: Extended structural equation and statistical modeling. *Psychometrika*, 81(2), 535–549. doi:10.1007/s1133601494358

See Also

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

Examples

```
## Not run:
# Generate data using the simStateSpace package-----
beta_mu <- matrix(
  data = c(
    0.7, 0.5, -0.1,
    0.0, 0.6, 0.4,
    0, 0, 0.5
  ),
  nrow = 3
)
beta_sigma <- diag(3 * 3)
beta <- simStateSpace::SimBetaN(
  n = 5,
  beta = beta_mu,
  vcov_beta_vec_l = t(chol(beta_sigma))
)
sim <- simStateSpace::SimSSMVARIVary(
  n = 5,
  time = 100,
  mu0 = list(rep(x = 0, times = 3)),
  sigma0_l = list(t(chol(diag(3)))),
  alpha = list(rep(x = 0, times = 3)),
  beta = beta,
  psi_l = list(t(chol(diag(3))))
)
data <- as.data.frame(sim)

# Fit the model-----
library(fitDTVARMx)
fit <- FitDTVARIDMx(
  data = data,
  observed = c("y1", "y2", "y3"),
  id = "id"
)

# Multivariate meta-analysis-----
library(metaVAR)
meta <- MetaVARMx(fit)
print(meta)
summary(meta)
coef(meta)
vcov(meta)

## End(Not run)
```

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

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. |

Value

Returns a matrix of estimates, standard errors, test statistics, degrees of freedom, p-values, and confidence intervals.

Author(s)

Ivan Jacob Agaloos Pesigan

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

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. |

Value

Returns a matrix of estimates, standard errors, test statistics, degrees of freedom, p-values, and confidence intervals.

Author(s)

Ivan Jacob Agaloos Pesigan

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

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 sampling variance-covariance matrix of the estimated parameters.

Author(s)

Ivan Jacob Agaloos Pesigan

Index

* Meta-Analysis of VAR Functions

Meta, [2](#)

MetaVARmX, [4](#)

* metaVAR

Meta, [2](#)

MetaVARmX, [4](#)

* meta

Meta, [2](#)

MetaVARmX, [4](#)

* methods

coef.metavarmeta, [2](#)

print.metavarmeta, [7](#)

summary.metavarmeta, [7](#)

vcov.metavarmeta, [8](#)

coef.metavarmeta, [2](#)

fitDTVARmX::FitDTVARIDmX(), [4](#), [5](#)

Meta, [2](#), [6](#)

MetaVARmX, [4](#), [4](#)

print.metavarmeta, [7](#)

summary.metavarmeta, [7](#)

vcov.metavarmeta, [8](#)