

Package ‘MSVAR’

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Title Markov Switching VAR

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Depends R (>= 2.0.1)

Description MSVAR estimates a 2 state Markov Switching VAR. The likelihood function is solved via numerical optimization using R’s ‘nlminb’ optimization routine. Further packages will include models with more than 2 states, switching exogenous variables and the use of simulated annealing in the optimization process to avoid finding local solutions.

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EX_R

Hamilton's FX Data

Description

EX_R This is the French Franc/USD data was used in Hamilton and Engel's paper "Long Swings in the Dollar: Are They in the Data and Do Markets Know It?", American Economic Review, Sept. 1990.

Value

a list containing:

EX_R Changes in French Franc/USD Exchange Rate

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INT_D

Hamilton's Interest Rate Data

Description

INT_D This is the interest rate differential data was used in Hamilton and Engel's paper "Long Swings in the Dollar: Are They in the Data and Do Markets Know It?", American Economic Review, Sept. 1990.

Value

a list containing:

INT_D Interest Rate Differential for France and United States

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MS_Var *Estimate Markov Switching VAR*

Description

MS_Var Estimates the Markov Switching VAR. Set-up optimization parameters and reports output.

Usage

```
MS_Var (dep)
```

Arguments

dep Matrix of endogenous variables

Value

a list containing:

```
transitionmatrix        Markov transition probabilities for each state
coefficients            constant coefficients for each state
Loglikelihood           sum of log likelihood for the model
densities               vector state probability densities
residuals               vector of residuals for each state
FilteredProbs           vector of filtered probabilities for each state
smoothed Probs         vector of filtered probabilities for each state
```

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Examples

```
# Use the data-set 'Hamilton_Data.csv' to reproduce Hamilton's results
# from "Long Swings in the Dollar: Are They in the Data and
# Do Markets Know It?", American Economic Review, Sept. 1990

data("EX_R")
data("INT_D")
dep<-cbind(EX_R, INT_D)
res<-MS_Var(dep)
```

MS_Var_Likelihood *Likelihood Function for Markov Switching VAR*

Description

MS_Var This is the likelihood function for the Markov Switching VAR which is minimized by `nlnmb`.

Usage

```
MS_Var_Likelihood(params)
```

Arguments

params A Vector of Initial Parameter estimates

Value

a scalar:

LL sum of log likelihood for the model

Author(s)

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MS_Var_Likelihood_Output

Likelihood Function Output for Markov Switching VAR

Description

MS_Var This function gathers the output from the likelihood function using the optimal parameters found by `nlnmb`.

Usage

```
MS_Var_Likelihood_Output(params)
```

Arguments

params A Vector of Initial Parameter estimates

Value

a list containing

- transition matrix Markov transition probabilities for each state
- coefficients constant coefficients for each state
- Log-likelihood sum of log likelihood for the model
- densities vector state probability densities
- residuals vector of residuals for each state
- Filtered Probs vector of filtered probabilities for each state

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