Automatic identification and estimation of Generalized VEC models

Description

This function identifies the VAR and performs one of the two versions of the identification algorithm described in Arbues, Ledo, Matilla (2016).

Usage

```
autoGVEC(x, var.order = "BIC", pvarmax = 2 * frequency(y), vec.order =
"AIC", pvecmax = 2 * frequency(y), logtrans = T, eps1 =
log(nrow(x))/sqrt(nrow(x)), eps2 = log(nrow(x))/sqrt(nrow(x)), d =
"BIC", method = 0)
```

Arguments

`x`	A multivariate series whose model we want to identify.
`var.order`	Order of the VAR model fitted. If var.order="AIC" or var.order="BIC", the order is identified by an information criterion.
`pvarmax`	Maximum order of the VAR. Used only if var.order="AIC" or var.order="BIC".
`vec.order`	Order of the GVEC model fitted. If vec.order="AIC" or vec.order="BIC", the order is identified by an information criterion.
`pvecmax`	Maximum order of the GVEC. Used only if vec.order="AIC" or vec.order="BIC".
`logtrans`	If TRUE, log transform applied.
`eps1`	Margin or tolerance for the approximate Smith algorithm.
`eps2`	Margin or tolerance to separate unit roots (usually, equal to `eps1`).
`d`	Deterministic effects. It may be a list with a subset among "i" (intercept), "t" (trend) or equal to "AIC" or "BIC" to use information criteria instead.
`method`	if equal to 0, first version of the algorithm, otherwise, second version is applied.

Details

The algorithm are explained in the article. The only departures are: (i) we allow to use different coefficients for the approximate Smith algorithm and to separate the unit roots (ii) intercept and deterministic linear trends can be included in the model.

Value

A list with the following:

`deltas`	is a list with the distinct polynomials of the Smith form.
`pvec`	finally chosen order of the GVEC.
`estcoef`	estimated coefficients of the GVEC.
`pvar`	finally chosen order of the VAR.
`D`	Smith form.

`sigma` covariance matrix of the GVEC.

`determ` deterministic terms of the GVEC.

`list.Delta` difference operators of the GVEC. These are the Delta_jkl operators in proposition 3.

Author(s)

Ignacio Arbues.

References

Arbues, Ledo, Matilla (2016).

Examples

```
n<-200
xmat<-apply(matrix(rnorm(2*n),nrow=n),2,cumsum)
x<-ts(data=xmat,frequency=4,start=c(1,1))
model<-
autoGVEC(x,var.order='BIC',vec.order='BIC',logtrans=F,d='BIC',eps1=log
(log(n))/sqrt(n),eps2=log(log(n))/sqrt(n),method=1)
pred<-GVECpred(x,4,model,64)
```

Computes GVEC forecasts.

Description

We use recursive prediction to calculate forecasts to a given horizon.

Usage

```
GVECfit(y, s, model, h )
```

Arguments

y	A multivariate time series to wich append forecasts.
s	Seasonality: number of observations per year. If nonseasonal, s=1.
`model`	A list with the following items: `model$deltas` distinct polynomials;`model$determ` contains the deterministic terms; `model$pvec` autoregressive order.
h	Forecasting horizon.

Details

More information in the article.

Value

A time series object with the forecasts.

Author(s)

Ignacio Arbués.

References

Arbues, Ledo (2013).

Examples

```
xmat<-apply(matrix(rnorm(2*n),nrow=n),2,cumsum)
x<-ts(data=xmat,frequency=4,start=c(1,1))
delta1<-polynomial(coef=c(1))
deltas<-list(delta1)
model<-GVECfit(x,deltas,p=1,s=1,d=list())
pred<-GVECpred(x,1,model,8)
```