

linearFeedbackModel

May 18, 2016

R topics documented:

lfm 1

Index 4

lfm	<i>Estimate the linear feedback model in Blundell, Griffith and Windmeijer (2002)</i>
-----	---

Description

Estimate the linear feedback model in Blundell, Griffith and Windmeijer "Individual effects and dynamics in count data models", Journal of Econometrics 108 (2002) 113-131

Usage

```
lfm(formula, data, effect = "individual", model = "onestep")
```

Arguments

formula	Similar to the pgmm() function in package plm. A symbolic description for the model to be estimated. Indicate a multi-part formula, the first two parts describing the covariates and the gmm instruments and, if any, the third part the 'normal' instruments. The first independent variable must be the lag of the dependent variable.
data	A pdata.frame.
effect	Either "individual" or "twoways". The former only includes individual fixed effects while the latter also includes time fixed effects.
effect	Either "onestep" or "twosteps". Whether to do one-step GMM or two-step GMM.

Value

call	The matched call
coefficients	The estimated coefficient
D	The average of the Jacobian of the sample moment conditions over each individual
fitted.values	data.frame of fitted values
first	The first stage estimates
fixed.effects	Estimates of the individual fixed effects
model	The variables used for estimation for each individual
residuals	data.frame of residuals
vcov	The covariance matrix of the coefficients
W1	The first-stage weight matrix used
W2	The second-stage (efficient) weight matrix used (only returned if model = "twosteps" is used)
Z	The instrument matrix for each individual

Examples

```

library(linearFeedbackModel)
library(plm)
set.seed(123)

# Create some data - follow example in Blundell, Griffith and Windmeijer (2002):

nT      <- 8      # Number of time periods
N       <- 500    # Number of individuals
gamma   <- 0.5    # Coefficient on lagged dependent variable
beta    <- 0.5    # Coefficient on x
rho     <- 0.5    # For the starting values of x
tau     <- 0.1    # For effect of individual effects on x
var_eta <- 0.5    # Variance of distribution of individual fixed effects
var_epsilon <- 0.5 # Variance of distribution of x

# Parameters to be estimated:
theta <- c(gamma, beta)

# Draw individual effects:
eta <- rnorm(N, mean = 0, sd = sqrt(var_eta))

# Draws for starting values of x:
xi <- rnorm(N, mean = 0, sd = sqrt(var_epsilon / (1 - rho^2)))

# Draw initial conditions for x and y:
x0 <- (tau / (1 - rho)) * eta + xi
y0 <- sapply(1:N, function(i) rpois(1, lambda = exp(x0 * beta + eta[i])))

# Dataset to be created: List for each time period

```

```

df <- vector("list", length = nT)

# Create first time period:
x <- rho * x0 + tau * eta + rnorm(N, mean = 0, sd = sqrt(var_epsilon))
y <- sapply(1:N, function(i)
  rpois(1, lambda = gamma * y0 + exp(beta * x0[i] + eta[i])))
df[[1]] <- data.frame(i = 1:N, t = 1, x = x, y = y)

# Create all following time periods:
for (t in 2:nT) {
  x <- rho * df[[t - 1]]$x + tau * eta +
    rnorm(N, mean = 0, sd = sqrt(var_epsilon))
  y <- sapply(1:N, function(i) rpois(1, lambda = gamma * df[[t - 1]]$y[i] +
    exp(beta * df[[t - 1]]$x[i] + eta[i])))
  df[[t]] <- data.frame(i = 1:N, t = t, x = x, y = y)
}
# Combine into one dataset:
df <- do.call(rbind, df)

# Convert to pdata.frame:
data <- pdata.frame(df, index = c("i", "t"))

test <- lfm(y ~ lag(y, k = 1) + x | lag(y, k = 2:4) + lag(x, k = 1:4),
  data = data, effect = "individual", model = "onestep")
print(summary(test))

```

Index

l_{fm}, [1](#)