Modelos estáticos para datos de panel

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library(readr)

QUIM\_CHINA <- read\_csv("QUIM\_CHINA.csv")

# Estructura de panel de datos  
library(plm)  
QUIM\_CHINA.pdata <- pdata.frame(QUIM\_CHINA,index=c("firm", "year"))  
pdim(QUIM\_CHINA.pdata)

## Balanced Panel: n = 12552, T = 3, N = 37656

library(AER)

library(alr4)

library(stargazer)

#  
# Modelo plano

#  
CD\_panel\_pool\_mod <- plm(log(Y) ~ log(K)+log(L)+log(M), data = QUIM\_CHINA.pdata, model = "pooling")  
stargazer(CD\_panel\_pool\_mod, type="text")

##   
## ===========================================  
## Dependent variable:   
## ------------------------------  
## log(Y)   
## -------------------------------------------  
## log(K) 0.089\*\*\*   
## (0.002)   
##   
## log(L) 0.127\*\*\*   
## (0.002)   
##   
## log(M) 0.765\*\*\*   
## (0.002)   
##   
## Constant 1.457\*\*\*   
## (0.013)   
##   
## -------------------------------------------  
## Observations 37,656   
## R2 0.924   
## Adjusted R2 0.924   
## F Statistic 152,645.100\*\*\* (df = 3; 37652)  
## ===========================================  
## Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

#

# Modelo de efectos fijos (transversales)

#  
CD\_panel\_fe\_mod <- plm(log(Y) ~ log(K)+log(L)+log(M), data = QUIM\_CHINA.pdata, model = "within")  
stargazer(CD\_panel\_fe\_mod, type="text")

##   
## ==========================================  
## Dependent variable:   
## -----------------------------  
## log(Y)   
## ------------------------------------------  
## log(K) 0.070\*\*\*   
## (0.004)   
##   
## log(L) 0.145\*\*\*   
## (0.006)   
##   
## log(M) 0.662\*\*\*   
## (0.003)   
##   
## ------------------------------------------  
## Observations 37,656   
## R2 0.686   
## Adjusted R2 0.529   
## F Statistic 18,295.900\*\*\* (df = 3; 25101)  
## ==========================================  
## Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

# Comparación del mdelo plano frente al modelo de efectos fijos  
pFtest(CD\_panel\_fe\_mod, CD\_panel\_pool\_mod)

##   
## F test for individual effects  
##   
## data: log(Y) ~ log(K) + log(L) + log(M)  
## F = 3.8581, df1 = 12551, df2 = 25101, p-value < 2.2e-16  
## alternative hypothesis: significant effects

# Modelo de efectos fijos (transversales y temporales)  
# CD\_panel\_fete\_mod <- plm(log(Y) ~ log(K)+log(L)+log(M), data = QUIM\_CHINA.pdata, model = "within", effect = "twoways")  
# stargazer(CD\_panel\_fete\_mod, type="text")  
#  
# Modelo de efectos aleatorios (transversales)

#  
CD\_panel\_re\_mod <- plm(log(Y) ~ log(K)+log(L)+log(M), data = QUIM\_CHINA.pdata, model = "random")  
stargazer(CD\_panel\_re\_mod, type="text")

##   
## ========================================  
## Dependent variable:   
## ---------------------------  
## log(Y)   
## ----------------------------------------  
## log(K) 0.094\*\*\*   
## (0.002)   
##   
## log(L) 0.140\*\*\*   
## (0.003)   
##   
## log(M) 0.735\*\*\*   
## (0.002)   
##   
## Constant 1.664\*\*\*   
## (0.017)   
##   
## ----------------------------------------  
## Observations 37,656   
## R2 0.878   
## Adjusted R2 0.878   
## F Statistic 270,834.200\*\*\*   
## ========================================  
## Note: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

# Significación de efectos individuales  
plmtest(CD\_panel\_pool\_mod, effect="individual")

##   
## Lagrange Multiplier Test - (Honda) for balanced panels  
##   
## data: log(Y) ~ log(K) + log(L) + log(M)  
## normal = 89.816, p-value < 2.2e-16  
## alternative hypothesis: significant effects

plmtest(CD\_panel\_pool\_mod, effect = "twoways" )

##   
## Lagrange Multiplier Test - two-ways effects (Honda) for balanced  
## panels  
##   
## data: log(Y) ~ log(K) + log(L) + log(M)  
## normal = 133.28, p-value < 2.2e-16  
## alternative hypothesis: significant effects

# Comparación del modelo de efectos aleatorios frente al modelo de efectos fijos (test de Hausman)  
phtest(CD\_panel\_fe\_mod, CD\_panel\_re\_mod)

##   
## Hausman Test  
##   
## data: log(Y) ~ log(K) + log(L) + log(M)  
## chisq = 1061.6, df = 3, p-value < 2.2e-16  
## alternative hypothesis: one model is inconsistent

# # Modelo de efectos aleatorios (transversales) y fijos (temporales)  
# CD\_panel\_fete\_mod <- plm(log(Y) ~ log(K)+log(L)+log(M), data = QUIM\_CHINA.pdata, model = "random", effect = "twoways")  
# stargazer(CD\_panel\_fete\_mod, type="text")