ReturnstoEducationPanel-Mar_4_DM.R

danny

2020-03-18

```r
# Authors: Gordon Burtch and Gautam Ray
# Course: MSBA 6440
# Session: Fixed Effects
# Topic: Returns to Education Fixed Effects
# Lecture 5

library(stargazer)
```

```
##
## Please cite as:

##  Hlavac, Marek (2018). stargazer: Well-Formatted Regression and Summary Statistics Tables.

##  R package version 5.2.2. https://CRAN.R-project.org/package=stargazer
```

```r
library(plm)

PData<-read.csv("KoopTobias.csv")

# Let's try a fixed effect regression.

within_reg <- plm(data=PData,LOGWAGE~EDUC,index=c("PERSONID"),effect="individual",model="within")

pooling_reg <- plm(data=PData,LOGWAGE~EDUC,index=c("PERSONID"),effect="individual",model="pooling")

ols_reg <-lm(data=PData,LOGWAGE~EDUC)

#Let's see if panel data model is needed

pFtest(within_reg, pooling_reg)
```

```
##
##  F test for individual effects
##
## data:  LOGWAGE ~ EDUC
## F = 8.949, df1 = 2177, df2 = 15740, p-value < 2.2e-16
## alternative hypothesis: significant effects
```

```r
stargazer(within_reg,pooling_reg, ols_reg, title="Within vs. Pooling Models vs. OLS",column.labels = c(
```

```
##
## Within vs. Pooling Models vs. OLS
## =================================================================================================
##                                                          Dependent variable:
```

```
##                    -----------------------------------------------------------------------
##                                                    LOGWAGE
##                                        panel                                    OLS
##                                        linear
##                             Within                Pooling                       OLS
##                              (1)                    (2)                          (3)
##                    -----------------------------------------------------------------------
## EDUC               0.198***               0.076***                    0.076***
##                     (0.006)               (0.002)                      (0.002)
##
## Constant                                  1.330***                    1.330***
##                                           (0.025)                      (0.025)
##
## ----------
## Observations              17,919                17,919                      17,919
## R2                        0.064                 0.077                       0.077
## Adjusted R2              -0.065                  0.077                       0.077
## Residual Std. Error                                            0.507 (df = 17917)
## F Statistic       1,084.241*** (df = 1; 15740) 1,496.940*** (df = 1; 17917) 1,496.940*** (df = 1;
## =================================================================================================
## Note:                                                            *p<0.1; **p<0.05; ***p
```

Fixed Effect vs Random Effect

```
within_reg <- plm(data=PData,LOGWAGE~EDUC + ABILITY,index=c("PERSONID"),effect="individual",model="withi

random_reg = plm(LOGWAGE ~ EDUC + ABILITY, data = PData, index=c("PERSONID"), effect="individual", model

stargazer(within_reg,random_reg, title="Fixed vs. Random Effect Model",column.labels = c("Within", "Ran
```

```
##
## Fixed vs. Random Effect Model
## =======================================================
##                         Dependent variable:
##               -----------------------------------------
##                              LOGWAGE
##                      Within                Random
##                       (1)                   (2)
## -------------------------------------------------------
## EDUC               0.198***              0.114***
##                     (0.006)               (0.004)
##
## ABILITY                                   0.004
##                                          (0.010)
##
## Constant                                  0.808***
##                                          (0.049)
##
## -------------------------------------------------------
## Observations              17,919                17,919
## R2                        0.064                 0.137
## Adjusted R2              -0.065                  0.137
## F Statistic   1,084.241*** (df = 1; 15740) 2,638.582***
## =======================================================
```

```
## Note:                        *p<0.1; **p<0.05; ***p<0.01
```

```r
# Hausman test
phtest(within_reg, random_reg)
```

```
##
##  Hausman Test
##
## data:  LOGWAGE ~ EDUC + ABILITY
## chisq = 333.13, df = 1, p-value < 2.2e-16
## alternative hypothesis: one model is inconsistent
```

```r
#Serial Correlation (Breusch Godfrey Test)

pbgtest(within_reg)
```

```
##
##  Breusch-Godfrey/Wooldridge test for serial correlation in panel
##  models
##
## data:  LOGWAGE ~ EDUC + ABILITY
## chisq = 1088.8, df = 1, p-value < 2.2e-16
## alternative hypothesis: serial correlation in idiosyncratic errors
```

```r
#Testing for Hetroskedasticity

library(lmtest)
```

```
## Warning: package 'lmtest' was built under R version 3.6.2
```

```
## Loading required package: zoo
```

```
## Warning: package 'zoo' was built under R version 3.6.2
```

```
##
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```r
bptest(LOGWAGE ~ EDUC + factor(PERSONID), data = PData)
```

```
##
##  studentized Breusch-Pagan test
##
## data:  LOGWAGE ~ EDUC + factor(PERSONID)
## BP = 4222.4, df = 2178, p-value < 2.2e-16
```

```
#Hetroskedasticity and Serial Correlation Consistent Estimator

coeftest(within_reg) # Original coefficients
```

```
##
## t test of coefficients:
##
##       Estimate Std. Error t value  Pr(>|t|)
## EDUC 0.1980043  0.0060133  32.928 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
coeftest(within_reg, vcovHC) # Heteroskedasticity consistent coefficients
```

```
##
## t test of coefficients:
##
##       Estimate Std. Error t value  Pr(>|t|)
## EDUC 0.198004   0.009866  20.069 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```