Example 5-1

September 12, 2020

[ ]:
```
# install the following package and libraries
install.packages("plm")

library("plm")
library("lmtest")
library("sandwich")
```

[3]:
```
##---------------------------------Block 1---------------------------------

#### Example 5-1 ####

## ------------------------------------------------------------------------
data("Produc", package = "plm")
fm <- log(gsp) ~ log(pcap) + log(pc) + log(emp) + unemp

## ------------------------------------------------------------------------
# heteroskedasticity robust pooled OLS model using lm
lmmod <- lm(fm, Produc)
coeftest(lmmod, vcov = vcovHC)
```

```
t test of coefficients:

              Estimate Std. Error t value  Pr(>|t|)
(Intercept)  1.6433023  0.0716070 22.9489 < 2.2e-16 ***
log(pcap)    0.1550070  0.0186973  8.2903 4.668e-16 ***
log(pc)      0.3091902  0.0126283 24.4839 < 2.2e-16 ***
log(emp)     0.5939349  0.0197887 30.0139 < 2.2e-16 ***
unemp       -0.0067330  0.0013501 -4.9872 7.497e-07 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

[4]:
```
##---------------------------------Block 2---------------------------------

# heteroskedasticity robust pooled OLS model using plm
plmmod <- plm(fm, Produc, model = "pooling")
summary(plmmod, vcov = vcovHC)
```

```
Pooling Model

Note: Coefficient variance-covariance matrix supplied: vcovHC

Call:
plm(formula = fm, data = Produc, model = "pooling")

Balanced Panel: n = 48, T = 17, N = 816

Residuals:
       Min.     1st Qu.      Median     3rd Qu.        Max.
-0.23176215 -0.06103699 -0.00010248  0.05085197  0.35111348

Coefficients:
              Estimate Std. Error t-value  Pr(>|t|)
(Intercept)  1.6433023  0.2441821  6.7298 3.211e-11 ***
log(pcap)    0.1550070  0.0601195  2.5783   0.01010 *
log(pc)      0.3091902  0.0462297  6.6881 4.209e-11 ***
log(emp)     0.5939349  0.0686061  8.6572 < 2.2e-16 ***
unemp       -0.0067330  0.0030904 -2.1787   0.02964 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Total Sum of Squares:    849.81
Residual Sum of Squares: 6.2942
R-Squared:      0.99259
Adj. R-Squared: 0.99256
F-statistic: 2778.06 on 4 and 47 DF, p-value: < 2.22e-16
```