Example 4-2

September 12, 2020

[5]:
```
# install the following packages and library
install.packages("plm")
install.packages("splm")

library("plm")
```

```
package 'splm' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\cwell\AppData\Local\Temp\RtmpqqV5GV\downloaded_packages
```

[9]:
```
##---------------------------------Block 1---------------------------------

#### Example 4-2 ####

## ------------------------------------------------------------------------
data("RiceFarms", package = "splm")
Rice <- pdata.frame(RiceFarms, index = "id")
rice.w <- plm(log(goutput) ~ log(seed) + log(totlabor) + log(size), Rice)
rice.r <- update(rice.w, model = "random")

# phtest() is the Hausman test.
# arguments are either the within and GLS model or the formula and data
phtest(rice.w, rice.r)
```

```
Hausman Test

data:  log(goutput) ~ log(seed) + log(totlabor) + log(size)
chisq = 3.775, df = 3, p-value = 0.2868
alternative hypothesis: one model is inconsistent
```

[11]:
```
##---------------------------------Block 2---------------------------------

# Mundlak (1978) approach. Takes the difference between the
# within and between estimators
rice.b <- update(rice.w, model = "between")
```

```
cp <- intersect(names(coef(rice.b)), names(coef(rice.w)))
dcoef <- coef(rice.w)[cp] - coef(rice.b)[cp]
V <- vcov(rice.w)[cp, cp] + vcov(rice.b)[cp, cp]
as.numeric(t(dcoef) %*% solve(V) %*% dcoef)

## ------------------------------------------------------------------------

# correlation coefficient between the individual effects and
# individual means of the explanatory variable
cor(fixef(rice.w), between(log(Rice$goutput)))
```

3.77284055832556

0.448045399935444

[12]:
```
##---------------------------------Block 3---------------------------------

data("RiceFarms", package = "splm")
pdim(RiceFarms, index = "id")

# piest() is the Chamberlain test. Input argument is formula and the data
piest(log(goutput) ~ log(seed) + log(totlabor) + log(size),
      RiceFarms, index = "id")
```

```
Balanced Panel: n = 171, T = 6, N = 1026


Chamberlain's pi test

data:  log(goutput) ~ log(seed) + log(totlabor) + log(size)
chisq = 113.72, df = 87, p-value = 0.02882
alternative hypothesis: within specification does not apply
```

[13]:
```
##---------------------------------Block 4---------------------------------

# Angrist and Newey (1991) test. Input argment is formula and the data
aneweytest(log(goutput) ~ log(seed) + log(totlabor) + log(size),
           RiceFarms, index = "id")
```

```
Angrist and Newey's test of within model

data:  log(goutput) ~ log(seed) + log(totlabor) + log(size)
chisq = 141.89, df = 87, p-value = 0.0001851
alternative hypothesis: within specification does not apply
```