ECON 4101 Econometrics
CM07 Homework

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```
require(data.table)
```

```
## Loading required package: data.table
```

```
dt <- as.data.table(read.csv("http://evansresearch.us/DSC/Spring2017/ECMT/Data/gewe.csv"))
dt <- melt.data.table(dt, id.vars = "X", measure = patterns("i_", "v_", "k_"), variable.name = "dummy",
    value.name = c("investment", "value", "capital"))
str(dt)
```

```
## Classes 'data.table' and 'data.frame':   40 obs. of  5 variables:
##  $ X         : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ dummy     : Factor w/ 2 levels "1","2": 1 1 1 1 1 1 1 1 1 1 ...
##  $ investment: num  33.1 45 77.2 44.6 48.1 74.4 113 91.9 61.3 56.8 ...
##  $ value     : num  1171 2016 2803 2040 2256 ...
##  $ capital   : num  97.8 104.4 118 156.2 172.6 ...
##  - attr(*, ".internal.selfref")=<externalptr>
```

```
# build restricted model
mod.r <- lm(dt$investment ~ dt$value + dt$capital)

# build unrestricted model
value.d <- ifelse(dt$dummy == 1, dt$value, 0)
capital.d <- ifelse(dt$dummy == 1, dt$capital, 0)
dummy <- ifelse(dt$dummy == 1, 1, 0)
mod.ur <- lm(dt$investment ~ dt$value + dt$capital + dummy + value.d + capital.d)

# conduct a Chow Test
res <- anova(mod.r, mod.ur)
res
```

```
## Analysis of Variance Table
##
## Model 1: dt$investment ~ dt$value + dt$capital
## Model 2: dt$investment ~ dt$value + dt$capital + dummy + value.d + capital.d
##   Res.Df   RSS Df Sum of Sq      F Pr(>F)
## 1     37 16563
## 2     34 14990  3    1573.2 1.1894 0.3284
```

The Chow Test tests the hypotheses:

$$H_0 : \text{Models are the same (data can be pooled)}$$
$$H_a : \text{Models are not the same (data should not be pooled)}$$

The p-value of 0.3283515 in our case suggests that we don't have sufficient evidence at the 5% significance level to advise against pooling the data; i.e. it's appropriate to combine the data.