Problem Set 7

Economemtrics

3a.

```r
library(stats)
library(AER)
```

```
## Loading required package: car

## Loading required package: carData

## Loading required package: lmtest

## Loading required package: zoo

##
## Attaching package: 'zoo'

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

## Loading required package: sandwich

## Loading required package: survival
```

```r
load("Angrist80_YOB_3039.Rda")

model <- lm(LWKLYWGE ~ EDUC + RACE + MARRIED + SMSA + NEWENG + MIDATL + ENOCENT + WNOCEN
model_summary <- summary(model)

test <- coeftest(model, vcov = vcovHC(model, type = "HC0"))
print(test, digits = 4)
```

```
##
## t test of coefficients:
##
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  5.0778234  0.0066656 761.796  < 2e-16 ***
## EDUC         0.0520464  0.0003473 149.877  < 2e-16 ***
## RACE        -0.2107128  0.0036513 -57.709  < 2e-16 ***
## MARRIED      0.2445162  0.0024763  98.741  < 2e-16 ***
```

```
## SMSA          -0.1418395  0.0023930 -59.272  < 2e-16 ***
## NEWENG        -0.0925392  0.0042347 -21.853  < 2e-16 ***
## MIDATL        -0.0143339  0.0032522  -4.407 1.05e-05 ***
## ENOCENT        0.0428862  0.0031277  13.712  < 2e-16 ***
## WNOCENT       -0.0701283  0.0040685 -17.237  < 2e-16 ***
## SOATL         -0.1050696  0.0032875 -31.961  < 2e-16 ***
## ESOCENT       -0.1202768  0.0043370 -27.733  < 2e-16 ***
## WSOCENT       -0.0583213  0.0037910 -15.384  < 2e-16 ***
## MT            -0.0674863  0.0046096 -14.640  < 2e-16 ***
## factor(YOB)41 -0.0081533  0.0044081  -1.850   0.0644 .
## factor(YOB)42 -0.0208870  0.0042166  -4.953 7.29e-07 ***
## factor(YOB)43 -0.0310513  0.0041738  -7.440 1.01e-13 ***
## factor(YOB)44 -0.0620105  0.0042415 -14.620  < 2e-16 ***
## factor(YOB)45 -0.0874218  0.0042407 -20.615  < 2e-16 ***
## factor(YOB)46 -0.1190692  0.0040468 -29.423  < 2e-16 ***
## factor(YOB)47 -0.1508475  0.0039670 -38.025  < 2e-16 ***
## factor(YOB)48 -0.1889845  0.0040080 -47.152  < 2e-16 ***
## factor(YOB)49 -0.2239961  0.0040453 -55.371  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

3b.

```
print(test["EDUC", "Std. Error"])
```

```
## [1] 0.0003472604
```

```
print(coef(model_summary)["EDUC", "Std. Error"])
```

```
## [1] 0.0002970865
```

```
print(cat(test["EDUC", "Std. Error"] - coef(model_summary)["EDUC", "Std. Error"], "\n"))
```

```
## 5.017388e-05
## NULL
```

The standard error for the heteroskedastic test is larger by 0.00005.

3c.

```
educ_int_het <- confint(test)["EDUC", ]
educ_int_homo <- confint(model)["EDUC", ]

print(educ_int_het)
```

```
##      2.5 %     97.5 %
## 0.05136576 0.05272700
```

```
print(cat((educ_int_het[2] - educ_int_het[1]) - (educ_int_homo[2] - educ_int_homo[1]), '
```

```
## 0.0001966785
## NULL
```

It is longer by 0.00019668. Heteroskedasticity does not appear to be a huge issue in this model as the results produced are fairly close in their values.