

ECN 3972
Lab 9

1. Download “CONS9.xls” from D2L. Install packages sandwich and lmtest on R.

Then, recall them:

In R:

```
library(mosaic)  
library(psych)
```

2. Load the data. Note it is an Excel file. Check the first few lines.

In R:

```
head(CONS9)
```

3. We want to estimate a consumption function, where consumption is a function of income and the interest rate:

$$con_t = \beta_0 + \beta_1 dpi_t + \beta_2 aaa_t + \varepsilon_t$$

where con_t = real personal consumption expenditures in year t (in billions of 2009 \$)

dpi_t = real disposable personal income in year t (in billions of 2009 \$)

aaa_t = real interest rate on Aaa corporate bonds in year t

The data also includes a year variable (*year*).

In R:

```
model1 = lm(con~dpi + aaa, data = CONS9)  
summary(model1)
```

4. Get residuals and plot against time (as measured by year).

In R:

```
res = resid(model1)  
xyplot(res~year, data=CONS9)
```

5. Get Durbin-Watson statistic. Note: the default alternative assumption is that there is positive serial correlation (one-sided test).

In R:

```
dwtest(model1, data=CONS9)
```

6. IF you have serial correlation, you can get Newey-West corrected standard errors.

In R:

```
NW_VCOV <- NeweyWest(model1, data=CONS9)  
sqrt(diag(NW_VCOV))
```

These are the correct standard errors to use then for t-tests on the coefficients.

7. Perform t-tests for the two coefficients, β_1 and β_2 . (Make hypotheses for one-sided tests.)