ECON 6511: Advanced Applied Econometrics
Homework 1
Due in class January 10, 2018

1. (Wooldridge, C2) Use the data in BARIUM.DTA for this exercise.

   (a) Add a linear time trend (t) to equation:

   $$\log(chnimp) = \beta_0 + \beta_1 \log(chempi) + \beta_2 \log(gas) + \beta_3 \log(rtwex) + \beta_4 befile6 + \beta_5 affile6 + \beta_6 afdec6$$

   Are any variables, other than the trend, statistically significant?

   (b) In the equation estimated above, test for the joint significance of all variables except the time trend. Compute this by hand. What do you conclude?

   (c) Add monthly dummy variables (January is the excluded month) to this equation and test for seasonality. Does including the monthly dummies change any other estimates or their standard errors in important ways?

2. (Wooldridge, C5) Use the data in EZANDERS.DTA for this exercise. The data are on monthly unemployment claims in Anderson Township in Indiana, from January 1980 through November 1988. In 1984, an enterprise zone (EZ) was located in Anderson (as well as other cities in Indiana).

   (a) Regress $\log(uclmns)$ on a linear (annual) time trend and 11 monthly dummy variables (exclude January). What was the overall trend in unemployment claims over this period? (Interpret the coefficient on the time trend.) Is there evidence of seasonality in unemployment claims?

   (b) Add ez, a dummy variable equal to 1 in the months Anderson had an EZ, to the regression above. Does having the enterprise zone seem to decrease unemployment claims? By how much? (Use the accurate formula from Chapter 7.)

   (c) What assumption do you need to make to attribute the effect in part (b) to the creation of an EZ?

3. (Wooldridge, C10) Consider the model:

   $$i3_t = \beta_0 + \beta_1 inf_t + \beta_2 def_t + u_t$$

   where $i3$ is the three-month T-bill rate, inf is the annual inflation rate based on the CPI, and def is the federal budget deficit as a percentage of GDP. Use the data in INTDEF.DTA.

(a) Find the correlation between inf and def over this sample period and comment.

(b) Add a single lag of inf and def to the equation and report the results in equation form.

(c) Compare the estimated LRP for the effect of inflation with that in the original equation without lags. Are they vastly different?

(d) Are the two lags in the model jointly significant at the 5% level?

4. (Wooldridge, C13) Use the data in MINWAGE.DTA for this exercise. In particular, use the employment and wage series for sector 232 (Men's and Boys' Furnishings). The variable $gwage232$ is the monthly growth (change in logs) in the average wage in sector 232, $gemp232$ is the growth in employment in sector 232, $gmwage$ is the growth in the federal minimum wage, and $gcpi$ is the growth in the (urban) Consumer Prince Index.

   (a) Run the regression $gwage232$ on $gmwage$, $gcpi$. Do the sign and magnitude of $\hat{\beta}_{gmwage}$ make sense to you? Explain. Is $gmwage$ statistically significant?

   (b) Add lags 1 through 12 of $gmwage$ to the equation in part (a). Do you think it is necessary to include these lags to estimate the long-run effect of minimum wage growth on wage growth in sector 232? Explain.

   (c) Run the regression $gemp232$ on $gmwage$, $gcpi$. Does minimum wage growth appear to have a contemporaneous effect on $gemp232$?

   (d) Add lags 1 through 12 to the employment growth equation. Does growth in minimum wage have a statistically significant effect on employment growth, either in the short run or long run? Explain.