Problem Set #9
Spring 2017

1. Take the s&p index *sp* from the file "s&p.dta".

   (a) Transform into returns: $r_t = 100\left(sp_t - sp_{t-1}\right)/sp_{t-1}$

   (b) Test the hypothesis of no serial correlation within this model by testing that the two autoregressive coefficients are jointly zero. Perform the test both using the classical F test and the robust F test. Is there a difference in the statistical "finding"? Which of the two tests is appropriate?

2. The file "realgdpgrowth.dta" has been augmented to include the following quarterly variables

   - t3month = rate on 3-month T-bill
   - t1year = rate on 1-year T-bill
   - t5year = rate on 5-year T-bill
   - t10year = rate on 10-year T-bill
   - AAA = rate on AAA corporate bonds
   - BAA = rate on BAA corporate bonds

     Note: The variables t1year, t5year and t10year are missing until 1953q2

   Create the transformed variables

   (a) spread1 = t1year-t3month

   (b) spread2 = t10year-t3month

   (c) corporate = BAA-AAA

   (d) dt3 = t3month-L.t3month

   (e) dt12 = t1year-L.t1year

   Describe in words the variables you created

3. Test the following hypotheses. For each, use three lags of all variables, and restrict the sample to 1954q2-2016q4 so all have the same number of observations.

   (a) *dt3* does not Granger-cause *gdp*

   (b) *dt12* does not Granger-cause *gdp*

   (c) *spread1* does not Granger-cause *gdp*

   (d) *spread2* does not Granger-cause *gdp*

   (e) *corporate* does not Granger-cause *gdp*

   Intrepret your findings

4. Of these five, which would you select to forecast GDP? Explain your reasoning.

5. Use your selected model to make point and interval forecast for 2017Q1, Q2, Q3 and Q4.