What Predicts Recessions?
My Graph / My Regression

This homework makes use of the following files:

      Data and regressions (EVIEWS and Excel Versions)

           DATA_EVIEWS_recessions.wf1
           DATA_EXCEL_recessions.xls

      Charts (Excel Files)

           Unemployment_Rate_Recessions_Shaded.xls.
   *Real_GDP_Recession_Comparisons.xls*

The data files include the four key macro variables (GDP growth rates, inflation, interest rates, and unemployment rates). They also include the following variables downloaded from the St. Louis Fed: (http://research.stlouisfed.org/fred2/)

- HRS_MANUF - Average Weekly Hours Worked in Manufacturing (in Hours)
- HOUS_START - Housing Starts (in Thousands)
- SAVINGS_RATE - Personal Savings Rate (%)
- CONS_SENTIMENT - Consumer Sentiment (1966Q1=100)
- PCE_DURABLE - Personal Consumption Expenditures: Durable Goods ($B, Seasonally Adjusted at Annual Rates (SAAR))
- PCE_NONDURABLE - Personal Consumption Expenditures: NonDurable Goods ($B, SAAR)
- PCE_SERVICES - Personal Consumption Expenditures: Services ($B, SAAR)
- ENERGY_CPI - Energy Consumer Price Index (1982=100)
- DEFENSE_SPEND – Federal Defense Expenditures and Investment ($B, SAAR)

Choose <u>one</u> of these new variables to focus on throughout the assignment. We will call it my_var in the rest of the text.

<u>Your problem is to determine if my_var helps to predict recessions.</u>

Picture: Make A Graph That Highlights the Recessions

**Unemployment Rate**
NBER Recession Quarters in White
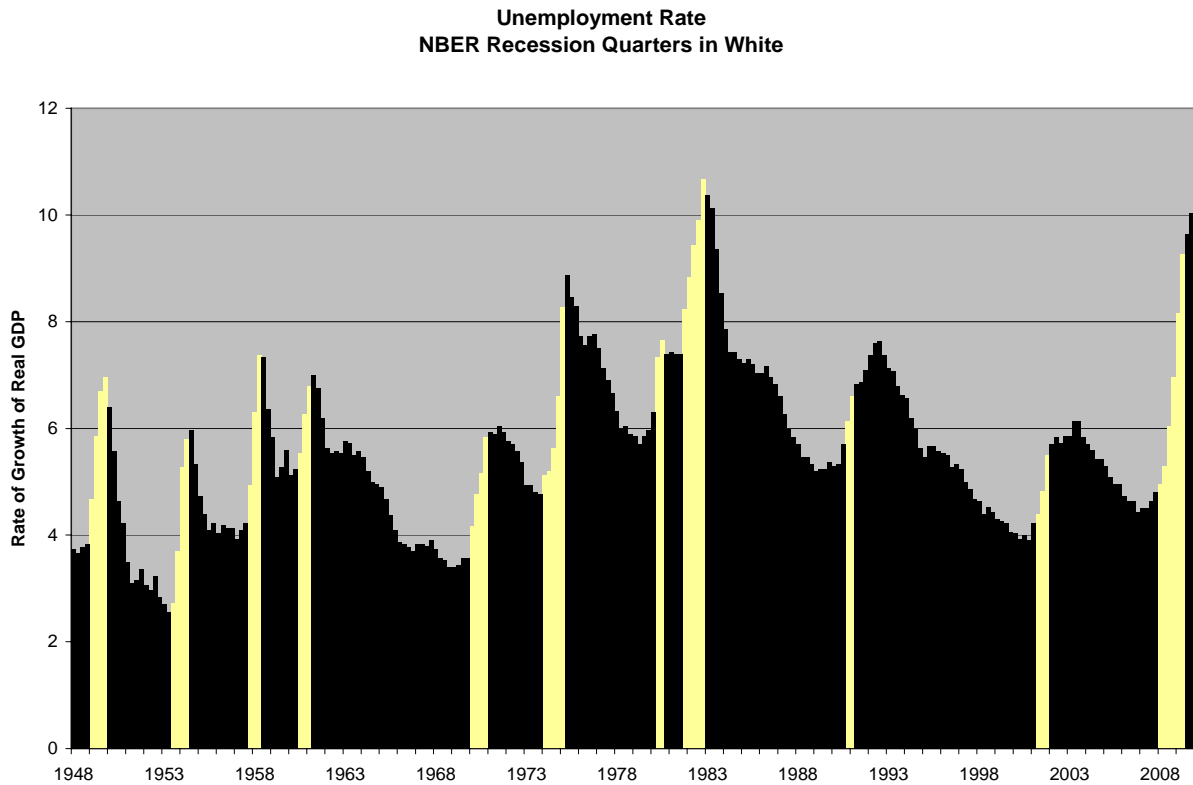
The graph above can be found in the excel file *Unemployment_Rate_Recessions_Shaded.xls*.
It illustrates the rate of unemployment with recessions shaded and helps to see if unemployment
is behaving peculiarly before, during and after recessions. Make a graph like this with my_var,
wisely transformed if necessary. All you need to do is to paste my_var into the excel file in the
DATA worksheet in the appropriate place in the column labeled "Unemployment Rate". Then
save the file under a new name and make changes to the labeling of the chart.

You may need to transform the data in some way to make the display as clear as possible.
Consider looking at: growth rates of it; shares of it relative to GDP; percentage changes; etc. If
you transform your data, make sure to include the formula you use to do so in your assignment.

Growth: g_my_var=100*(my_var/my_var(-1))^4-100
Share: sh_my_var=my_var/gdp
Quarterly percent change: pcqq_my_var=(my_var-my_var(-1))/my_var(-1)

To make your graph readable to someone who hasn't seen it before, make sure it has: 1) a title
that tells the story you want to communicate and 2) axis labels, including units. To make your
story the most convincing possible, you also want to consider: sampling (e.g. what dates to
include); scaling (what the top and the bottom points are on the vertical axis); and, framing of the
graph (e.g. is it wider than tall or taller than wide).

2.   Picture: Make A Recession Comparison Graph

Real GDP Around the Business Cycle Peaks
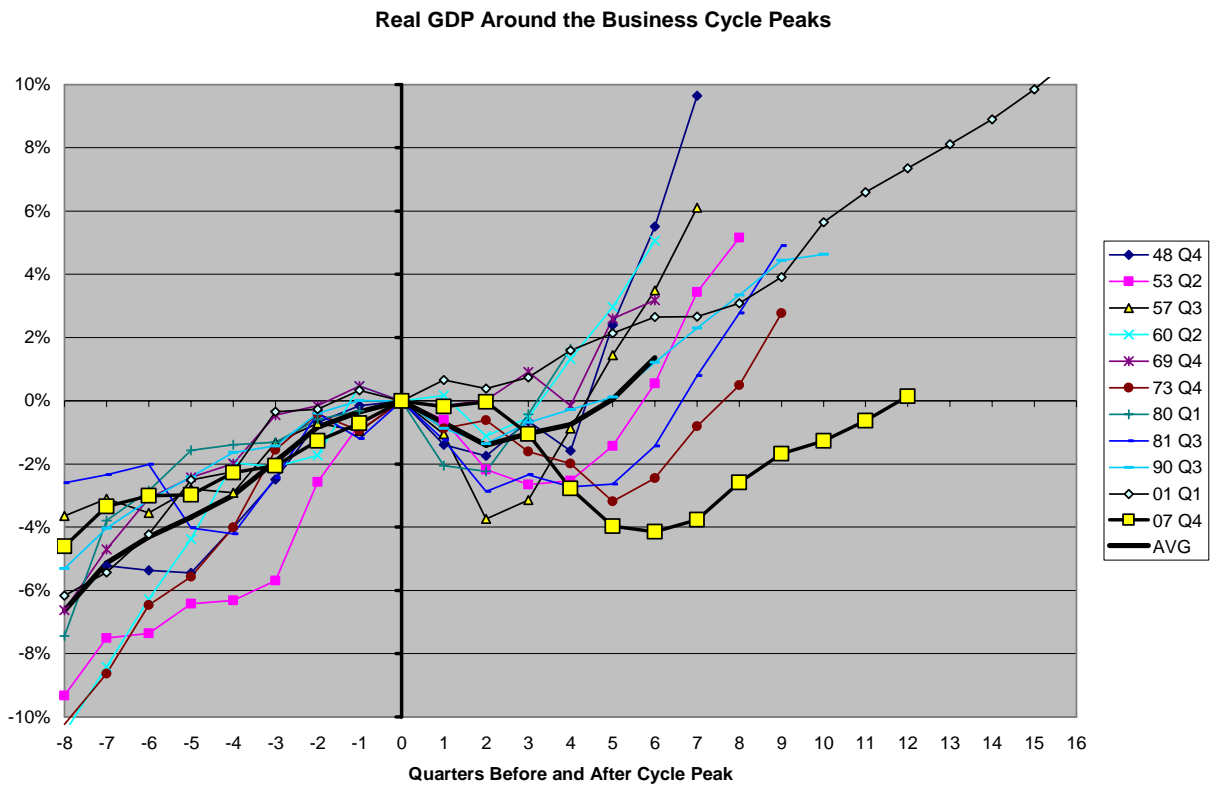
The graph above is embedded in the Excel file *Real_GDP_Recession_Comparisons.xls*. Can you see that GDP growth declines a bit in the two quarters before the recession, and grows very rapidly in the year after?

Now make a graph like this for my_var, appropriately transformed if necessary. All you need to do is to paste my_var in the appropriate part of the column labeled RGDP in the worksheet labeled Data.

3.   Based on these two graphs write no more than three sentences that indicate whether or not my_var helps to predict recessions.

4. Numbers: Modify The Regression

Add your variable of interest (or a transformed version) to the base equation, already included in the workfile, which attempts to explain economic growth, to create your equation.   You can do so at the command line in Eviews typing:

equation **my_equation**.ls g c g(-1) g(-2) i(-1) i(-2) r(-1) r(-1)-r(-2) u(-1) u(-1)-u(-2) *MY_VARS*

where *MY_VARS* refers to one or more lagged values of my_var.   Make sure your my_var is lagged one period so it is predictive. You may also want to include a momentum term, my_var(-1)- my_var(-2), if you think changes in the variable are important. (You will need to use a momentum term if you include two lags and the sign on one of the lags is positive while the sign on the other lag is negative and roughly the same magnitude.)

If you include one lag only *MY_VARS* would read:
                my_var(-1)
If you include two lags *MY_VARS* would read:
                my_var(-1) my_var(-2);
If you included one lag and a momentum term *MY_VARS* would read:
                my_var (-1) my_var (-1)-my_var (-2).

Based on this regression, after controlling for the other variables does your variable help or not? Yes, No, maybe.

5. STORY: Write Three to Five Sentences

Write *no more than* <u>five</u> sentences explaining the impact of my_var on economic growth and its behavior during/around recessions.   Make sure your story, your picture and your numbers are all in alignment.