

Assignment #1

Due Monday, February 11th @ 5:30pm

This first assignment is designed to get you familiar with basic empirical analysis techniques and economic data from the Bureau of Economic Analysis (BEA), Census Bureau, and Federal Reserve Economics Database (FRED). In handing in your work for the following exercises, you should not turn in the raw data, but rather what is asked for (graphs, tables, written explanations). Your responses should be typed. Some data for these exercises are available on the course web site in EViews workfiles, but you will need to retrieve some data on your own. For all growth rates, use the log approximation.

Please look through the data analysis guide in Hoover (2005), the supplements (Presentation of Data and on the course web site -- both provide examples of graphs and tables should look like. While you can choose how to present the data, there is key information required to make a graph useful. You will not receive credit if your graphs are not formatted correctly.

1. Working with Raw Macroeconomic Data

Obtain the following seasonally adjusted (SA or SAAR) data series from the Federal Reserve Economic Database (FRED):

- Consumer Price Index for All Urban Consumers: All Items
 - Real Gross Domestic Product, 1 Decimal
 - M1 Money Stock
 - Civilian Unemployment Rate
 - Effective Federal Funds Rate
- (a) Which of these variables are trending upward over time? For these series, transform the data into annualized monthly growth rates. From this point forward, use the transformed series rather than the raw data you obtained above.
- (b) Create a quarterly EViews workfile with your data. Create time series graphs for each of the transformed data series. All of your graphs should include the following:
- Clear labels of the variables (indicating any transformations) in the vertical axes
 - Years in the format “YYYY” (e.g., 1990 instead of 1990:1 or 90) on the horizontal axes.
 - NBER Recession dates shaded
- (c) From your graphs, describe how each of these six variables behave during recessions.

2. Using Data to Test Macroeconomic Theory

This question will use the workfile you created for the previous question. You will use the data to conduct preliminary analysis of some key macroeconomic theories.

- (a) According to the Phillips Curve, there is a negative relationship between inflation and unemployment. Using the data above, create a plot of inflation (vertical axis) against unemployment. Does the Phillips Curve appear to hold in your sample? Explain.
- (b) While macroeconomists disagree on a great number of things, they are all agreed on one thing: money growth creates inflation. Create a scatterplot of inflation (vertical axis) against the M1 money growth rate. Do the data support this consensus? Explain.
- (c) According to the monetarists, money “leads” output. This means that periods of positive money growth occur immediately before periods of rising economic growth. Similarly, periods of negative money growth occur immediately before falling or negative economic growth. Create a time series plot of money and output growth. Do the data support this contention? Explain.
- (d) The Federal Reserve uses the interest rate to implement monetary policy. According to your data, do changes in the federal funds rate affect the inflation rate? Provide a graph to examine this claim.

3. Presidential Terms and Economic Performance

Data for Questions 3-5 are available in the workfile “macro.wf1”.

Presidents get more of the blame and take more credit for the state of the economy than they probably deserve. Nevertheless, presidential terms are convenient reference points for analysis of historical episodes.

- (a) Calculate and display in a table, the average annual rates of quarterly real GDP growth and inflation for each presidential term starting with Eisenhower. For consistency, a quarterly measure of prices: the Personal Consumption Expenditures Price Index (PCE Deflator). When computing the annual growth rates of quarterly data, use the following formula to generate a variable “YGR” that is the growth rate of real GDP (named “Y”) in your workfile) in EViews:

$$\text{genr YGR} = 100 * (\log(Y) - \log(Y(-4)))$$

You can use the same basic formula to create a new variable, INF using the PCE Deflator (“PCE” in the workfile). For the most recent president, use the most recently available data. If a president left/entered office in the middle of the year, use your judgment in completing the GDP and inflation computations. You should explain/defend your choice in your presentation of the tables in part (c) below.

- (b) Make another table listing the presidents from highest to lowest GDP growth. Then create another table ranking presidents based on lowest to highest inflation.
- (c) On the basis of these last two tables, which president do you regard as most successful (or luckiest) in terms of the state of the economy? Explain your own balancing of real GDP versus inflation as a factor for evaluating success. You should have at least a paragraph to explain your methodology and write up the analysis required to answer this question.
- (d) What is the relationship between economic performance and the ability of the President to remain in office for a second term? Create any tables/graphs that you believe would be useful in making your argument. Again, you should have at least a paragraph to explain your methodology and write up the analysis required to answer this question.

4. Business Cycle Dating

Many macroeconomics textbooks identify a recession as being defined by two consecutive quarters of falling real GDP. This question compares the “rule of thumb” definition with the one more often used in the media (and by economists). Using quarterly real GDP data (seasonally adjusted, chained 2000 dollars, 1947-). You can use the data provided to you in the workfile used in Question 1.

- Compute the annualized growth rate (using the difference in the natural logs).
 - Identify post-World War II recessions using the “rule of thumb” definition.
- (a) Compare your dating with those given by the National Bureau of Economic Research (NBER) and the “rule of thumb” dating in a table. Are there any recessions that you identified that NBER did not? Are there recessions that you and NBER date differently? Identify these recessions and dates.
- (b) Go to the NBER Business Cycle Dating page www.nber.org/cycles/main.html. Read information relating to NBER’s procedures. In light of this information, explain how and why your dates from (b) differ from the official NBER dates.

5. Trends vs. Cycles

Using quarterly real GDP data (from question 3), complete each of the following exercises.

- (a) Run a regression of the log of real GDP on constant and time trend and complete the following steps:
 - (1) Compute the log-linear trend for real GDP (this is the predicted value from the regression).
 - (2) Create a graph of the log of real GDP and the trend computed in step 1. On your graph, report the regression equation.
 - (3) Using the graph you created in step (2), include the NBER recession dates.
 - (4) Compute the deviation in log real GDP from its log-linear trend. Multiply by 100 to make this a percentage. This series is “detrended real GDP”.
 - (5) Graph the detrended real GDP series on a graph with the NBER recession dates shaded. What should the mean of this series be? What does the standard deviation tell us about the business cycle? You should have a total of two graphs for part (a) of this question.
- (b) Most economists agree that the U.S. entered a long-run, or “trend” slowdown in economic growth beginning in 1974. How might such a slowdown affect policy makers’ interpretations of deviations in real GDP from an empirically-based trend like the ones you computed in above? How might you deal with this problem?

6. Price Stability and Fed Chairmen

For the following exercises, you will need to retrieve Bureau of Labor Statistics data. Instead of going to the BLS directly, we will make use the Federal Reserve Economics Database, or “FRED”. Download the following data on monthly consumer prices (1947:1-present):

- Consumer Price Index – All Urban Consumers (All Items, Seasonally adjusted (SA))
- Consumer Price Index – All Urban Consumers (All Items Less Food and Energy, SA)

Using the log-differences approximation to complete the following exercises:

- (a) Create a time series plot with the *annual* inflation rates using the two different price series above. Use the same basic formula you used in Question 3 (for monthly data instead of quarterly).
- (b) Create a figure showing the annual inflation rate for the CPI-All items and the core CPI inflation rate. Compute the mean and standard deviation for each series and comment on your findings.
- (c) In a table, report the mean and standard deviation for both inflation series during the following periods: full sample (1948:1-present), 1948:1-1970:1, 1970:2-1979:7, 1979:8-1987:7 and 1987:8-2006:1
- (d) Evaluate the success of Alan Greenspan’s term (1987:8-2006:1) with respect to maintaining low inflation and price stability. Use hypothesis testing to evaluate his success relative to the full sample and the sub-samples you used in part (b).