Chapter 4: Data Exploration Problems

1. How does inflation affect nominal interest rates? *(LO3)*
   a. Plot the three-month U.S. Treasury bill interest rate (FRED code: TB3MS) from 1960 to present. What long-run pattern do you observe? What may have caused this pattern?

   Hint: At the FRED Web site, go to "Data Tools," select "Create Your Own Graphs," and input the code for the Treasury bill rate (FRED code: TB3MS) in the search box under "Add Data Series." To alter the start date, set January 1960 in the first "Observation Date Range" dropdown box that appears under the "Line 1" summary of the data. Then select "Redraw Graph."

   b. Plot the inflation rate based on the percent change from a year ago of the U.S. consumer price index (FRED code: CPIAUCSL) from 1960 to the present. How does U.S. inflation history reflect your explanation in part (a)?

   Hint: Go to the FRED Web site, select "Data Tools" and then "Create Your Own Graphs." In the search box under "Add Data Series," type in the code for the CPI (FRED code: CPIAUCSL). Next, at the "Units" dropdown box, select "Percentage Change from Year Ago" and then "Redraw Graph."

2. In Data Exploration Problem 1, you saw the impact of U.S. inflation on short-term U.S. Treasury bill rates. Now examine similar data for Brazil. *(LO3)*

   Hint: Use the hints from Data Exploration Problem 1, substituting the Brazilian data codes for the U.S. data codes.

   a. Plot the Brazilian Treasury bill rate (FRED code: INTGSTBRM193N). Notice the range of values and compare them with the range in the U.S. Treasury bill plot from Data Exploration problem 1.
   b. Plot the inflation rate based on the percent change from a year ago of the Brazilian consumer price index (FRED code: BRACPIALLMINMEI). Comment on the inflation rate in Brazil. Download the data to a spreadsheet. (You may need to widen the spreadsheet column to see the data.) What happens to the index in the1990–1994 period?

3. The *expected* real interest rate is the rate that people use in making decisions about the future. It is the difference between the nominal interest rate and the *expected* inflation rate, not the *actual* inflation rate. How does expected inflation over the coming year compare with actual inflation over the past year? Plot the inflation rate since 1978 based on the percent change from a year ago of the U.S. consumer price index (FRED code: CPIAUCSL). Add to this figure as a second line the expected inflation rate from the University of Michigan survey of

consumers (FRED code: MICH). Is expected inflation always in line with actual inflation? Which is more stable? *(LO3)*

Hint: Go to the FRED Web site, select "Data Tools" and then "Create Your Own Graphs." In the search box under "Add Data Series," type in the code for the consumer price index (FRED code: CPIAUCSL). At the "Units" dropdown box, select "Percentage Change from Year Ago," and then choose "Redraw Graph." To add expected inflation as a second line, select "Add Data Series," and type the Michigan survey code (FRED code: MICH) into the search box. To the right of the "Observation Date Range" boxes, click "Copy to All Lines," and then select "Redraw Graph."

4. Plot the *expected* real interest rate since 1978 by subtracting the Michigan survey inflation measure (FRED code: MICH) from the three-month Treasury bill rate (FRED code: TB3MS). Plot as a second line the ex post or *realized* real interest rate by subtracting from the three-month Treasury bill rate (FRED code: TB3MS) the actual inflation rate based on the percent change from a year ago of the consumer price index (FRED code: CPIAUCSL). What does it mean when these two measures are different? *(LO3)*

Hint: After selecting "Data Tools" and then "Create Your Own Graph, plot the Treasury bill rate (FRED code: TB3MS). Set the Observation Date Range to begin in January 1978; then select "Add Data Series," choose the "Line 1" button and type the survey inflation measure (FRED code: MICH) in the search box. In the Formula box, type "a – b" and then select "Redraw Graph." You should now see the expected real interest rate. Repeat this procedure, but substitute annual CPI inflation for MICH. Specifically, at the "Add Data Series" box, start again with the Treasury bill rate code (FRED code: TB3MS) and set the Observation Date Range to begin in January 1978. Then choose the Add Data Series box, click the "Line 2" button, enter the CPI code (FRED code: CPIAUCSL) in the search box, and select "Percentage Change from Year Ago" at the "Units" dropdown box. Type in "a – b" (without the quotes) at the "Formula" box and then select "Redraw Graph."