Financial Econometrics
FINN/ECON 6219, Fall 2023

Problem Set 4
Due December 13th at 5:30 pm
Upload a **PDF file** with your solutions in Canvas

Attach a copy of your Stata code **at the end of your solutions**

Read the article "The Yield Curve as a Leading Indicator: Some Practical Issues" that is posted along with the problem set.

a. The authors use a measure of the slope of the yield curve to predict recessions. This is accomplished by fitting a probit model, which is a type of regression model with a binary dependent variable (i.e., either $y_t = 0$ or $y_t = 1$ with 1 indicating the economy is in recession). Try to replicate their Chart 2 using the `probit` command in Stata (see the blue-shade box labelled "The Probability Model" for details on constructing the plot). You can obtain the necessary data on the yields from FRED (look at GS10 and TB3MS). The NBER recession dates are given in the article. Copy and paste your version of Chart 2 into your solutions. Do your parameter estimates match those reported in the article?
b. The two primary data series that the NBER uses to identify recessions are real gross domestic product (GDP) and real gross domestic income (GDI). Use quarterly data from FRED (look at GDPC1 and A261RX1Q020SBEA) to compute quarterly growth rates for each series for 1959Q1 to 2005Q4. Use a regression approach with the yield spread as your regressor to construct direct one-year-ahead ahead forecasts of the quarterly growth rate for each series. For example, your forecast of the real GDP growth rate for 1959Q1 should be based on the yield spread for December 1957. Copy and paste the output from the `reg` command for each variable into your solutions. Interpret your results. Are they consistent with the evidence presented in the article? Explain your reasoning. You might find the following link useful: https://www.statalist.org/forums/forum/general-stata-discussion/general/1417762-how-to-keep-the-end-of-each-quarterly-observation-from-monthly-dataset
c. Repeat the forecasting exercise in part (b) using a regression model that uses the yield spread and both growth rates as regressors. For example, your forecast of the real GDP growth rate for 1959Q1 should be based on the yield spread for December 1957, the real GDP growth rate for 1957Q4, and real GDI growth rate for 1957Q4. Interpret your results.
d. Use a bivariate VAR model to test whether the real GDP and real GDI levels (not growth rates) are cointegrated. Base the test on data for 1959Q1 to 2005Q4. Select the order of the VAR model using the `varsoc` command. Copy and paste the table produced by the `vecrank` command into your solutions.