

Midterm Exam – March 2, 2021

Instructions

- i. Answer all 10 questions.
- ii. You may type your work or write it all by hand, or a combination. If you write it all by hand, make sure to write neatly. I prefer you type your explanations, but if you type a lot slower than you can write neatly, don't worry about it. If you decide to type most of it, feel free to write the equations by hand—only type them if you are a master and can type them as fast as you can write them neatly.
- iii. Show and explain your work where relevant. A correct final answer, without explanation, is worth little. A good explanation and mostly correct work, with a wrong final answer due to a small mistake, is worth a lot.
- iv. Be neat and concise.
- v. List and explain any assumptions you make.
- vi. You may use any resources available other than speaking or otherwise communicating with anyone else.
- vii. Keep your camera, microphone, and speakers on for proctoring and for test related communications.
- viii. Upload an electronic copy of your work to canvas by 7:00 PM.

Background

You are interested in determinants of housing prices in Florida. You have the following three hypotheses:

- i) Building permits mean an anticipated increase in future supply. So when building permits increase, you expect a decrease in price shortly thereafter.
- ii) The cost of borrowing to build or buy a home depends on the real interest rate, Interest. This is the difference between the interest rate and expected inflation. So, when interest rates increase, you expect housing prices to fall shortly thereafter. are higher at time $t-1$, you expect housing prices to be lower at time t .
- iii) When inflation is expected to be higher, home prices go up accordingly. So, when inflation expectations increase, you expect an increase in home prices shortly thereafter.

You have monthly data on the median per square foot price of homes listed for sale in Florida since July of 2016. You plan to ignore data after December of 2019 for this purpose. Assume, for purposes of this question, that gathering more data from earlier periods is not possible. (In reality, it exists, it is just not readily available for free and on FRED.) You will need to keep in mind the limitations imposed on model complexity by the amount of data. In particular, you do not have enough data to estimate models with many lags for multiple variables while keeping a reasonable number of degrees of freedom.

Given the limited data, you have in mind the following causal model:

$$\ln List_t = \beta_0 + \beta_p \ln Permits_{t-1} + \beta_{Int} \ln Interest_{t-1} + \beta_{Inf} \ln Inflation_{t-1} + r_t.$$

A Stata log file, augmented with several graphs, accompanies this exam.