

AGEC 622
05_time_series_1 Exercises
Due before the beginning of the next class

- Complete the exercises in the provided notebook “05_exercises_LASTNAME_FIRSTNAME.xlsx”.
- **Rename your file, replacing “LASTNAME_FIRSTNAME” with your actual names.**
- If there is more than one question, note that each will have its own tab in the workbook.
- **Work vertically down the sheet** within your notebook. Separate the individual parts of the question(s) (a, b, c, . . .) using dividing rows like the blue example dividers in the file.
- Submit this homework by emailing your xlsx file to henry@tamu.edu, **with the subject “AGEC 622 exercises 05”**.

1) **Question 1**

The overall objective of this question is to characterize the probability of the barley price being below \$4.50 at various times following the last available historical observation.

- a) **Determine differences and lags.** Use the DF test to determine a number of differences that will render the data stationary. Then determine the optimal number of lags for the AR model using the SIC approach.
- b) **Estimate the AR model.** Use Simetar’s ”Time Series” wizard. Use the appropriate values from the previous step to specify the model. Ask Simetar for twelve ”forecast periods”.
- c) **Consider a restriction.** What are the values for the SIC and AIC both for the estimated model and for the model where you restrict the first lag to be zero? Do you conclude that the lag should be in the model, or that it should be removed?
- d) **Simulate the barley price.** Use the AR model, including a stochastic error/innovation term, to simulate the barley price for twelve periods ahead. Check that the mean stochastic values for each period are close to the deterministic forecasts that Simetar generated.
- e) **Answer the main question.** What is the probability of the barley price being below \$4.50 in each of the twelve out of sample periods?
- f) **Interpret.** How much confidence do you have in the assessments from the previous step? What factors might lead you to question those assessments?