

## Research Paper

### ECON 4115/5115 Time Series Analysis & Forecasting

#### I. Proposal (20 pts) – Due Friday, September 29

The research proposal serves two purposes: (1) it forces you to carefully think through the goals and methods of the project; and (2) it allows me to provide more thoughtful feedback. Without carefully thinking through the goals and methods, it is easy to waste valuable time heading down unproductive paths. The topic of your research paper does not need to be within economics. *However, the UW Center for Business and Economic Analysis is contracted to provide forecasts of the Wyoming's economy. If you choose a sector of Wyoming's economy (e.g., energy prices, GDP, unemployment rate, population, etc.), the CBEA may choose to add your forecasts into its presentations to industry and communities.*

The proposal should be typed and no more than two double-spaced pages. Assume your audience has little-to-no training in time series forecasting or economics, using easy to understand terminology to describe your project. Use equations sparingly and write the proposal in a narrative form. Below is a suggested outline for the proposal:

#### Suggested Outline of the Proposal

- A. Title of the Paper
- B. Introduction
  - 1. For whom and for what purpose?
  - 2. Literature review. Has anyone else built a forecasting model? If so, who?
- C. Time Series Data Summary
  - 1. Definitions, data sources, and table of summary statistics
  - 2. Time series plots
- D. Possible Forecasting Method
  - 1. Time series vs. econometrics. Will you be using other explanatory variables?
  - 2. Likely forecasting horizon
  - 3. Likely methods for assessing accuracy of forecasts
- D. Conclusion (who will benefit from your forecasts?)

#### II. Paper (80 pts) – Due Friday, December 8

You can choose the preferred structure of your research paper. However, it is common for academic scholarly papers to include five sections: introduction, model, data, results and conclusion. The sections should include the five steps of forecasting from Chapter 1. For a time series forecasting paper, it probably makes more sense to have the data section come before the model section. The results section should also include an evaluation of the accuracy of the forecasting model. The paper is to be no more than five double-spaced, typewritten pages (excluding appendices). You will be rewarded for clarity and using proper grammar.

### Suggested Outline of the Paper

#### A. Title Page (not included in the page count)

#### B. Introduction

1. State the objective of your project
2. Provide a motivation for why your project is interesting and who will use the forecasts
3. Brief literature review

#### C. Data

1. Definitions of the variable(s)
2. Data source(s)
3. Frequency and sample size
4. Data problems (i.e., mismeasurement, missing observations, etc.)
5. Data summary table w/ descriptive statistics

#### D. Model

1. Identify the dependent (and possible independent variables)
2. Mathematical representation of the forecasting model

#### E. Forecasting Results

1. Include a summary of model output (do not cut and paste directly from R!)
2. Include a time series plot of the main variable and the forecasts
3. Include a table assessing the accuracy of the model

#### F. Conclusion

1. Summarize the significance and shortcomings of the research
2. Discuss any extensions

ECON 5115 students: For graduate credit, students must include 1) a more thorough literature review with a minimum of five citations and 2) an econometric model to compete against your time series forecasting model. For #2, you should include a formal comparison of the two models. The paper can be no more than **seven** double-spaced, typewritten pages for graduate credit (excluding appendices).