

## EXERCISE 3

### Time Series Regression Exercise

#### Working with the Time Series Decision Tree

**Purpose:** To learn how to discriminate between different types of time series models. You will find four different data sets posted on the website for this course. They are labeled DATA1, DATA2, DATA3, and DATA4. The first column of the data set represents the observation number, the next column designates the X variable, and the third column designates the Y variable. Use the time series decision tree that you have been provided on the course website to complete the following tasks for each data set. You should hand in your work on this exercise in four separate notebooks, one for each data set. I am asking that you work on this project independently from your classmates. I want to be able to see what you can do on your own. If you have any questions, be sure and come by and see me rather than relying on your classmates.

1. Plot the series individually and, in a combined graph, plot the two series together. Hand in the three plots.
2. Use the Augmented Dickey-Fuller Unit Root test to determine the stochastic orders of your two series. If you find a series to be  $I(1)$  be sure and test the differences of the data to be  $I(1)$  and not  $I(2)$ .
3. Follow the decision tree and determine which of the four models is appropriate for the series of your data set. If you are testing for cointegration, use both the Engle/Granger single equation test and Johansen's max-lambda and trace tests.
4. Write out the estimated form of the model you have chosen including the coefficient estimates and the standard errors in parentheses underneath the coefficient estimates.