

EC 613:

Advanced Topics in Financial Econometrics

Fall 2010

Time Series Examples With R — Part 1: ARMA

Example: This example is about an analysis of a time series of monthly pepper prices in USD from Oct 1973 through Apr 1996. It requires the installation of two R packages: **tseries** and **AER**. The latter accompanies the book *Applied Econometrics with R* (Kleiber and Zeileis, Springer, 2008); it contains the pepper price series.

- a) Load the packages **tseries**, **AER**, and the dataset **PepperPrice**.
- b) Read the description of **PepperPrice**. (Enter `?PepperPrice` in the R console.)
- c) Define the series of black pepper prices and the series of its log returns.
- d) Plot both series.
- e) Test both series for the presence of unit roots. (Use the ADF test.) What are your conclusions?
- f) Plot the acf and the pacf of the series of log returns. What are your conclusions?
- g) Fit an AR(1) model to the series of log returns. What is your estimated model? Is it meaningful?
- h) Fit an MA(1) model to the series of log returns. What is your estimated model? Is it meaningful?
- i) Which model is better: AR(1) or MA(1)? Or is there no reason to prefer either model?
- j) Test the two price series for cointegration.