Tutorial 3 Time Series Analysis

Stochastic Time Series: VAR modeling- contagion and spillover effects during the financial crisis

1. Upload the following time series “house”, “bonds”, “stocks”, “commodity”. (12/29/2000 to 04/30/2007)

2. Generate the continuously compounded returns of the time series.

3. Are the resulting time series stationary? Use an appropriate Unit root test. Decide whether you have to include trend / intercept components.

4. Estimate a VAR model containing all time series, use the lag length criteria to determine the appropriate number of lags. Keep in mind to use an ordering based on economic theory.

5. Please do a block significance test. Use a causality test to examine the dependence structure between lags.

6. Examine the dependence structure between the asset classes using Variance Decomposition and impulse response functions. What are your results?

7. Please upload the same time series using the sample from 05/01/2007 to 12/03/2009. We want to compare both samples to examine whether the dependence structure changed during the financial crisis and thereafter. Do we find contagion effects?

8. Estimate a VAR model using the “financial crisis”-sample and compare the Variance decompositions and Impulse response functions. Can we find significant differences?

9. Please upload the hedge fund index. Include this index into your crisis-VAR-model and examine whether the inclusion changes the previous results significantly.