

Homework #2

Vector Autoregression and Error-Correction Models

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Time Series Analysis

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In this assignment, you will use Vector Autoregression (VAR) and Error-Correction Models to analyze the dynamic relationships among the policy mood and economic expectations variables from the first homework assignment and a new macroeconomic variable, inflation, which is the annual change in the Consumer Price Index (from the Bureau of Labor Statistics). Start by estimating a VAR model and then estimate a Error-Correction model using the Engle-Granger methodology. Compare the two approaches. Specifically, what do they tell you about the dynamic relationship between inflation, economic expectations, and the country's policy mood?

1 Estimate a VAR Model (see pp. 321-325 in Enders)

- (a) Determine the lag structure for your VAR. Make sure to justify your choice.
- (b) Estimate the VAR, run diagnostics on the residuals, and check the model's stability. Do you have a good model?
- (c) Implement and interpret a full set of Granger causality tests.
- (d) Implement and interpret a full set of innovation accounting analyses.
- (e) Focus on the "causal" relationship between inflation on the one hand and economic expectations and policy mood on the other. What is the effect of an innovation in inflation on economic expectations and the public's policy mood? What assumptions/restrictions are you making? How sensitive are your results to these assumptions/restrictions?

2 Estimate an ECM (see pp. 377-385 in Enders)

- (a) Pretest the variables in your dataset in order to determine their order of integration.
- (b) Estimate the long-run equilibrium relationship among the variables and test for cointegration.

- (c) Estimate the Error-correction model, run a full set of diagnostics, and conduct the ECM equivalent of Granger causality tests.

3 Comparing the VAR and ECM

- (a) Do the VAR and ECM suggest the same kind of relationships between inflation, economic expectations and policy mood? If not, what do you think accounts for the differences?
- (b) Which model is more appropriate for analyzing these relationships? Explain.