

Exercises Week 5

1. VECM Models

1. Explain the concept of cointegration. What distinguishes a cointegrated series from a spurious regression?
2. Consider two integrated time series $y_{1,t}$ and $y_{2,t}$. Define formally what it means for these series to be cointegrated. Include conditions for cointegration.
3. Write down the mathematical form of a simple Vector Error Correction Model (VECM) for two cointegrated variables and explain the role of adjustment parameters.
4. Describe Johansen's Methodology for testing cointegration. Outline the main steps involved and explain the use of trace and maximum eigenvalue tests.

2. VECM Estimation - Computational Problem

The Central Bank of Macronova is analyzing the country's macroeconomic environment. They have collected historical data on GDP and Consumption to assess whether a stable long-term relationship exists between these two crucial variables.

Using the provided dataset:

1. Perform Johansen's test for cointegration between GDP and Consumption. Report and interpret the results.
2. Estimate a Vector Error Correction Model (VECM) for the data and interpret the estimated adjustment coefficients.
3. Provide a 5-period forecast for both variables using your estimated VECM. Interpret your results in the context of economic policy.