Harvard Extension Data Science

Dynamic Modeling and Forecasting in Big Data

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Assignment 10 (Last One, Yeah!)

Cointegration

- In H11_cointegration.R, we learned how to test if two stochastic time series have cointegration. If so, we might be able to use that long-term relationship to improve the model and forecast.
- Similar to looking into the cointegration between 10-year Treasury bond rates and 3-month Treasury bill rates, now let's look at the relationship between 30-year mortgage rate (m30) and 10-year Treasury rates (t10).
- Import the data from Fred:
  - *getSymbols("MORTGAGE30US", src="FRED")*
  - *getSymbols("DGS10", src="FRED")*
- Convert them to the monthly frequency and starts in April 1971.
- Calculate the error correction (ec = m30 – t10).
- Using the ADF test and DF-GLS test to determine that m30, t10, and ec are stationary or not.
- Run a simple Vector Error Correction Model (VECM) to see whether the error correction term is statistically significant.