

Practice Questions

True, False, or Uncertain and Explain

- i. The variance decomposition of two jointly stationary time series is unique.
- ii. Granger causality is always identical to Sims causality.
- iii. If a time series is stationary in levels, it does not possess a stochastic trend.
- iv. Every second order stationary time series possesses a fundamental moving average representation.
- v. Every second order stationary time series possesses an autoregressive representation.

Problems

- i. Suppose x_t is AR(1). Suppose that $x_t^* = x_t + \varepsilon_t$ where ε_t is white noise measurement error and is independent of x_t at all leads, lags and contemporaneously. Is x_t^* AR(1)? What does will be true the role of lagged x_t^* values in $x_{t|t-1}^*$. Interpret.
- ii. Suppose that

$$y_i = \theta x_i + \varepsilon_i$$

$$z_i = \beta y_i + \eta_i$$

$$x_i = \gamma z_i + \mu_i$$

Are the model parameters identified? Suppose we modify the system so that

$$y_i = \theta x_i + \delta r_i + \varepsilon_i$$

$$z_i = \beta y_i + \eta_i$$

$$x_i = \gamma z_i + \phi s_i + \mu_i$$

Is this system identified?