Exercise 3

Simon A. Broda

- 1. (a) Open the file simulations.xlsx. The sheet "AR(1)" simulates T=1000 observations from an AR(1) process. Play around with α and $-1<\phi_1<1$ and describe your observations.
 - (b) Also try setting $\phi_1 = 1$ and describe the effect of α .
 - (c) The file simulated_data.wfl contains three series simulated using the same spread-sheet, simulation.xlsx, one each for an AR(1), an MA(1), and an ARMA(1, 1) process. The AR and ARMA processes use $\phi_1=0.7$, and the MA and ARMA processes use $\theta_1=0.7$. Describe your observations.
- 2. (a) Use the Box-Jenkins approach to model year-on-year real GDP growth in the file realgdpch.wfl.
 - (b) Produce a forecast for 2022Q3 and 2022Q4, both manually and using EViews.
- 3. (a) Obtain the mean and variance of a random walk with drift.
 - (b) Show that the random walk with drift is integrated of order 1.
 - (c) Derive the expression for the variance of a stationary AR(1) given in the slides.
 - (d) Find the mean, variance, and ACF of an MA(1).
 - (e) **Optional**: Find the ACF of a stationary AR(1).