ECOM073: Topics in Financial Econometrics

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Exercise 1.

1.1. Table B.17 (see excel file) contains the quarterly dollar sales (in \$1000) of Marshall Field &Company for the period 1960 through 1975. Use different aspect ratios to plot this time series and comment on which aspect ration is preferable.

1.2. Repeat exercise 1.1 for the outstanding consumer credits data, provided in Table B.9.

1.3. Table B.15 (see excel file) contains the quarterly GDP data in UK for the period 1955 through 1969. Plot the GDP data. Plot the $\log(GDP)$ data. Create superimposed time series plots of GDP and $\log(GDP)$ data. Can the two time series be stationary?

Calculate and plot the log rate growth $\log(GDP_t) - \log(GDP_{t-1})$. Can this time series be stationary?

1.4. Compute the impulse response function

$$x_t = 0.6x_{t-1} - 0.2x_{t-2} + \varepsilon_t, \qquad for \quad t = 0, 1, 2, 3, 4, 5,$$

when we have a single shock $\varepsilon_0 = 1$ at time 0, whereas $\varepsilon_1 = \varepsilon_2 = \cdots = 0$. Assume also that $x_{-1} = 0$ and $x_{-2} = 0$.

Graph x_t and comment on patterns you observe.

Does the impact of shock on x_t decreases with increase of t? How many lags are needed for the impact of shock to be reduced by 50%?

1.5. Compute the impulse response function

$$x_t = \phi x_{t-1} + \varepsilon_t, \qquad for \quad t = 0, 1, 2, 3, 4, 5,$$

when we have a single shock $\varepsilon_0 = 1$ at time 0, whereas $\varepsilon_1 = \varepsilon_2 = \cdots = 0$. Assume also that $x_{-1} = 0$. Consider the following cases:

a) Let $\phi = 0.7$. Graph x_t and comment on patterns you observe.

b) Let $\phi = 1$. Graph x_t and comment on patterns you observe.