Homework 3

Due: October 15, 2018

Note: 1. Work alone. 2. Submit solutions of the home assignment to the TA. Only hard-copies are allowed.

1. Write Python functions for the test statistics S, K and JB.

2. Using the Python functions of Problem 1, perform the following for the KOSPI200 index during the period 2004:01-2018:08 (on the basis of monthly, closing prices; data available at https://ecos.bok.or.kr/flex/EasySearch.jsp).

    (a) Test the null of symmetry at the 5% level.

    (b) Test the null of normal tails at the 5% level.

    (c) Test the null of normality at the 5% level.

    (d) Plot the sample autocorrelation function. Do they indicate serial correlation?

    (e) Test the null of no serial correlation using the Ljung-Box test at the 5% level.

3. Write a Python program that calculates the present value of a bond as of January 1, 2015 that pays 2,000,000 won on December 31 every year from 2015 to 2019 and a lump-sum amount 100,000,000 won on December 31, 2019. Use the rate 0.04 per annum as a discount factor. Put the result in a separate output file.

4. Perform the following for the return series from the KOSPI200 index during the period the period 2004:01-2018:08 (on the basis of monthly, closing prices).

    (a) Plot the sample autocorrelation function. Do they indicate serial correlation?

    (b) Test the null of no serial correlation using the Ljung-Box test at the 5% level.