Assignment 2

1. Consider the daily stock returns of American Express (AXP), Caterpillar (CAT), and Starbucks (SBUX) from January 01, 2020 to February 10, 2023.

    d.   Test the null hypothesis that the mean of the log returns of each stock is zero. That is, perform three separate tests. Use 5% significance level to draw your conclusion. (You can use R function t.test() to answer the problem.)

2. Consider the monthly stock returns for General Motors (GM), CRSP value-weighted index (VW), CRSP equal weighted index (EW), and S&P composite index from January 1975 to December 2008. The returns of the indexes include dividend distributions. Data file is m-gm3dx7508.txt (date, gm, vw, ew, sp).

    d.   Test the null hypothesis that the mean of the log returns of each stock is zero. That is, perform three separate tests. Use 5% significance level to draw your conclusion.

3. Consider the daily log returns of American Express stock from January 01, 2020 to February 10, 2023 as in Exercise 1.1. Use the 5% significance level to perform the following tests:

    a.   Test the null hypothesis that the skewness of the returns is zero.

    b.   Test the null hypothesis that the excess kurtosis of the returns is zero.

4. Daily foreign exchange rates (spot rates) can be obtained from the Federal Reserve Bank in Chicago. The data are the noon buying rates in New York City certified by the Federal Reserve Bank of New York. Consider the exchange rates between the U.S. dollar and the Canadian dollar, euro, U.K. pound, and the Japanese yen from January 4, 2000, to March 27, 2009. The data are given on the Web.

c. Discuss the empirical characteristics of the log returns of the dollar-Japanese yen exchange rates.

d. Use kernel density estimation to obtain a density plot of the daily log returns of the dollar-euro exchange rates.