

Assignment 1

1.0. Use the package `quantmod` of R to download and plot the daily prices for the following stocks from January 1, 2015 to February 28, 2018.

- (1) Apple
- (2) Intel
- (3) Microsoft

In addition, you must add the main title and axis labels to the time plot.

1.1. Consider the daily stock returns of American Express (AXP), Caterpillar (CAT), and Starbucks (SBUX) from January 1999 to February 2018. The price data can be obtained by using R package `quantmod`.

- (a) Compute the simple returns in percentages. Compute the sample mean, standard deviation, skewness, excess kurtosis, minimum, and maximum of the percentage simple returns.
- (b) Transform the simple returns to log returns.
- (c) Express the log returns in percentages. Compute the sample mean, standard deviation, skewness, excess kurtosis, minimum, and maximum of the percentage log returns.

1.2. Consider the monthly stock returns for General Motors (GM), CRSP value-weighted index (VW), CRSP equalweighted 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).

- (a) Compute the simple returns in percentages. Compute the sample mean, standard deviation, skewness, excess kurtosis, minimum, and maximum of the percentage simple returns.
- (b) Transform the simple returns to log returns.
- (c) Express the log returns in percentages. Compute the sample mean, standard deviation, skewness, excess kurtosis, minimum, and maximum of the percentage log returns.

1.3. Consider the monthly stock returns of S&P composite index from January 1975 to December 2008 in Exercise 1.2. Answer the following questions:

- (a) What is the average annual log return over the data span?
- (b) Assume that there were no transaction costs. If one invested \$1.00 on the S&P composite index at the beginning of 1975, what was the value of the investment at the end of 2008?

- 1.5.** 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 also on the Web.
- (a) Compute the daily log return of each exchange rate.
 - (b) Compute the sample mean, standard deviation, skewness, excess kurtosis, minimum, and maximum of the log returns of each exchange rate.