Homework Assignment #1

Due Date: before class
- Campus class: April 9, 2004
- Evening class: April 8, 2004

Data files: Datasets may be obtained from course web site.

Assignment:

1. Consider the daily stock returns of American Express (axp), Caterpillar (cat) and starbucks (sbux) from January 1994 to December 2003. The data are simple returns and in the file d-3stock.txt (date, axp, cat, sbux).
   - Express the simple returns in percentages. Compute the sample mean, standard deviation, skewness, excess kurtosis, minimum, and maximum of the percentage simple returns.
   - Transform the simple returns to log returns.
   - Express the log returns in percentages. Compute the sample mean, standard deviation, skewness, excess kurtosis, minimum, and maximum of the percentage log returns.
   - Are the sample means of log returns statistically different from zero? Use 5% significance level to draw your conclusion.

2. Answer the same questions as Problem 1 but using monthly stock returns for IBM, CRSP value-weighted index (vw), CRSP equal-weighted index (ew) and S&P composite index from January 1975 to December 2003. The returns of the indexes include dividend distributions. Data files are m-ibm3dx7503.txt.

3. Consider the monthly stock returns of S&P composite index from January 1975 to December 2003 in Problem 2. Answer the following questions:
   - What is the average annual log return over the data span?
   - If one invested one dollar on the S&P composite index at the beginning of 1975, what was the value of the investment at the end of 2003? Assume that there were no transaction costs.

4. Consider the daily log returns of American Express stock from January 1994 to December 2003 as in Problem 1. Use 5% significance level to perform the following tests: (a) Test the null hypothesis that the skewness measure of the returns is zero; (b) Test the null hypothesis that the excess kurtosis of the returns is zero; (c) Test the null hypothesis that the first 5 lags of autocorrelations of the return series are all zero.
5. Daily foreign exchange rates (spot rates) can be obtained from the Federal Reserve Bank at Chicago. Consider the exchange rates between US Dollar and Canadian Dollar, Euro, UK Pound, and JP Yen from January 2000 to March 2004. (a) Compute the daily log return of each exchange rate, (b) Compute the sample mean, variance, skewness, excess kurtosis, minimum, and maximum of each exchange rate. Data are on Course web site.

**Reading assignment**: Chapter 1 and Chapter 2 (Sections 1 to 5) of the text.