Performance Measurement

`Risk_Factors.xlsx` contains monthly observations of the risk-free rate and the three Fama–French risk factors, all expressed as a percentage. These observations cover the ten-year period from Jan 2004 through Dec 2013.

→ Using excess returns for the ten industry portfolios, calculate the following performance metrics:

- Sharpe ratio
- Sortino ratio (using risk-free rate as target)
- Treynor ratio (using CAPM β)
- Jensen's α
- Three-factor α

The sample semi-variance can be estimated as:

$$1T\sum_{t=1T}\min\{R_{it}-R_{ft},0\}2$$

where R_i is return on industry portfolio and R_f is risk-free rate.

→ Create a table showing the performance metrics for the ten industry portfolios.

→ Plot your results as a bar chart for each performance metric.

→ Briefly explain the economic significance of each performance metric.

Please compile your results (including graphs and qualitative discussion of economic significance) and programming code into an Adobe PDF or Microsoft Word file. Please submit this file (without compression) to the submission folder for Homework 3 before Monday, 4 Oct.