Computer Homework 4

Evaluation of Portfolio Performance

(1) (20%) Introduction

Search for two actively managed mutual funds you think might be attractive investment for you from finance.yahoo.com. These funds should be the **U.S. domestic stock funds**. Briefly summarize the key information of these funds. For example, you may describe their investment objectives, past performance, and fees and expenses. In addition, for comparison purposes, please also put a passively managed fund – Vanguard 500 Index fund (VFINX) into your analysis.

(2) Performance measure:

(i) (10%) Return and risk

Collect monthly data from January 2014 to December 2018. Compute the monthly returns, mean returns, and standard deviations of these funds.

(ii) (20%) Standard CAPM

$$r_p - r_f = \alpha_p + \beta_p (r_M - r_f) + \varepsilon_p$$

Please compute and report the Sharpe measure, Treynor measure, Jensen measure, M^2, Treynor square, and information (appraisal) ratio by using standard CAPM. Compare the results with the passively managed Vanguard 500 Index fund (VFINX).

* Note that for the market returns, you should use those collected from WRDS or Kenneth French's website. Please do **not** use the returns of Vanguard 500 Index fund as the proxy of market returns.

(iii) Test market timing ability

By using the two tests— (1) Treynor and Mazuy; (2) Henriksson and Merton in the handout, check if those fund managers have good market timing skills.

(1) (10%) Treynor and Mazuy:

$$r_p - r_f = a + b(r_M - r_f) + c(r_M - r_f)^2 + \varepsilon_p$$

(2) (10%) Henriksson and Merton:

$$r_p - r_f = a + b(r_M - r_f) + c(r_M - r_f)D + \varepsilon_p$$

∗Useful function in excel : if()

(iV) (10%) Fama-French three factor model:

Using the same funds you choose above, now run a time-series regression and report the Jensen measures (alpha) by using Fama-French Three factor model.

$$r_p - r_f = \alpha_p + \beta_M (r_M - r_f) + \beta_{SMB} r_{SMB} + \beta_{HML} r_{HML} + \varepsilon_p$$

The Fama-French factors are available from WRDS or Kenneth R. French's website.
(http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)

Compare the Jensen's measures and adjusted R-squares of Fama-French three factor model with those of the standard CAPM. Also check if the explanatory variables are statistically significant or not. Please explain your findings.

(V) (10%) Carhart Four-factor model (Adding Momentum factor):
Add momentum factor (Mom) as the fourth factor and re-do part (IV).

$$r_p - r_f = \alpha_p + \beta_M (r_M - r_f) + \beta_{SMB} r_{SMB} + \beta_{HML} r_{HML} + \beta_{MOM} r_{MOM} + \varepsilon_p$$

Please explain your findings.

(VI) (10%) Fama-French five factor model:
Add profitability and investment factors as the fourth and the fifth factors and re-do part (IV).

$$r_p - r_f = \alpha_p + \beta_M (r_M - r_f) + \beta_{SMB} r_{SMB} + \beta_{HML} r_{HML} + \beta_{\mathrm{RMW}} r_{\mathrm{RMW}} + \beta_{\mathrm{CMA}} r_{\mathrm{CMA}} + \varepsilon_p$$

Please explain your findings.

∗ Please summarize in word document all the results in tables and provide your interpretations. You should provide regression results in appendix.