Assignment 5

Due: Wednesday, 03.31.17 at 11:59 pm

In this assignment you will conduct a performance analysis for a large U.S. mutual fund and attempt to relate fund performance to characteristics of the fund.

Mutual Fund Performance Evaluation

On Blackboard, you will find a spreadsheet containing historical returns as well as other information on the Fidelity Magellan Fund for the period 1968-2016. To conduct a performance analysis on this fund, you will also need data on different systematic risk factors. Go to Ken French's website and download monthly returns for the three Fama-French factors, the risk-free rate, and the momentum factor over the same sample period and add them to your spreadsheet. Note that the risk-free rate is included in the same file as the three Fama-French factors.

1. Estimate the Carhart 4-factor model for the Magellan fund by regressing its' excess returns on the four factors. Use the entire 1968-2016 sample period for this regressions.
   - What does the regression suggest about the investment strategy of this fund?
   - Based on the results from the 4-factor model, is this a good fund to invest in?
2. Perform *rolling window* 4-factor model regressions: In each month t (starting with the 60est month of the sample), estimate the regression using data for months $t-59$ to t.[1] Produce two plots:
   (a) Plot the time series of rolling-window alpha estimates, along with a rolling window average of the excess return (not adjusted for risk; also using data for months $t-59$ to t)
   (b) Plot the rolling-window beta estimates for the four factors. Put all four series in one plot.
3. Interpret the development of the coefficients with respect to the data provided about the fund (changes of the manager, expenses,...). Do you see any connection to the facts about the fund? Comment on the alphas.
4. In each month t, compute the average excess return on the market using data for months $t-59$ to t. Denote this variable by $\bar{r}_{M,t}$. Similarly, denote the average excess return on the Magellan Fund in months $t-59$ to t (computed in part 2a) by $\bar{r}_{F,t}$. Regress the variable 'flow' (in column I) in month t on $\bar{r}_{M,t}$ and $\bar{r}_{F,t}$ using the available dates ,i.e. 1991-2016.

[1] The easiest way to do this in Excel is the '=linest()' function. You can use linest as an array function and have it return all slope coefficients (betas) and the intercept (alpha) simultaneously. For estimating the 4-factor model, select a 5×1 block of cells, type =linest() with the appropriate inputs, then press SHIFT-CTRL-ENTER. Consulting the help page for LINEST may help.

- What does the variable 'flow' measure? *Hint: The spreadsheet contains a formula that computes flow.*
- Interpret the two estimated slope coefficients of your regression. *Hint: Keep in mind that this is a multivariate regression.*