Case 3: In Search of Skill

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DEADLINE

You are to hand in your assignments by 23:59 on December 5, 2013 (Thursday). Late submissions will have grades reduced by 0.5 for each full 30 minutes. Please send your assignments to m.zamojski.ta@gmail.com. You will receive an automated response email if your submission was successful.

GUIDELINES

- You can work in groups of 3-4 people only, the groups should be the same as for previous case(s).
- Please note, that the questions have a varied level of difficulty.
- There is a hard limit of 5 pages (including any tables, figures, references, title pages, etc.).
- Include an executive summary of your work on the 1st page (in principle, one line per question).
- Your answers should be concise and self-sufficient.
- You may use any computing environment you wish (incl. Excel, Stata, R, Matlab, Python, C++, etc.).
- You are to send your code/spreadsheets and all additional data files you used.
- In case you use Excel, your answers are not to be hard coded, i.e., if the underlying data is changed the results should update. If you are required to use Solver or Goal Seek for a particular question, this rule does not apply.

I. Introduction

In this assignment you are given the following monthly data (the Portfolios): gross returns for 4 mutual funds, net (-of-fees) returns for 5 hedge funds, net (-of-fees) returns for 4 equally

*There are no official office hours, but you can contact me at m.zamojski@vu.nl. Please note that you are supposed to send in your answers to m.zamojski.ta@gmail.com

weighted hedge fund style portfolios. Furthermore you are provided with factors necessary to estimate both the Carhart (1997) and Fung and Hsieh (2004) models.

Carhart (1997) is a popular extension to Fama and French (1993) model that you worked with in Case 1. It introduces a factor that accounts for the relative out-performance of past winners over past losers, the so-called momentum effect (UMD). In this model you use the following factors: Mkt-Rf, SMB, HML, and UMD.

Fung and Hsieh (2004) is a 7 factor model that is—currently—the most commonly used model to explain performance of hedge funds. The 7 factors in this model are: Mkt-Rf, Size Spread, Bond Market, Credit Spread, FH Bond Trend-following, FH Currency Trend-following, and FH Commodity Trend-following. They are meant to account for both traditional exposures and for returns generated by option-like instruments.

MAXIMISE YOUR GRADE!

In this case, it is crucial that you try to draw conclusions based on answers to all questions. You will be rewarded for not only how you perform each task, but also by how you combine different results.

II. Measuring portfolio performance based on the full sample

□ **Question 1**: For all Portfolios compute:

- arithmetic and geometric averages of returns
- variance (2nd central moment)
- skewness (3rd central moment)
- kurtosis (4th central moment)

Provide significance tests for the arithmetic mean, skewness and kurtosis. Discuss your results and, in particular, how portfolios differ from one another. Explain what does it mean for an investor if returns are negatively skewed and leptokurtic?

□ **Question 2**: For all Portfolios compute:

- Sharpe's ratio
- Treynor measure
- Jensen's alpha
- Information ratio

Which are the best funds based on these ratios alone? What if you incorporate your answers to Question 1?

HINT

In particular, think of how higher order moments are accounted for in these performance measures.

Question 3: For all Portfolios show what is the timing ability of managers based on the following models: □

- Treynor and Mazuy (1996)
- Henriksson and Merton (1981)

What do these models capture? Discuss your results.

Question 4: For **all** Portfolios estimate the Carhart (1997) and the Fung and Hsieh (2004) models. Discuss your results and their significance. Do you think one model is better than the other? □

Question 5: The five hedge funds represent one of styles you were given indices of. Can you guess the style of all hedge funds? Discuss relative performance of the two asset pricing models in explaining variation of returns of indices and individual funds. □

III. Portfolio performance in time

In the following questions, pick at least 3 representative portfolios[1] (one mutual fund, one hedge fund, one hedge fund index) to discuss your results in detail[2].

Question 6: Compute Sharpe's ratio and the variable of interest in one of the market-timing models from Question 3 using a moving windows of 60 months. Discuss your results. □

Question 7: Using a 5-year moving window, estimate both the Carhart (1997) and the Fung and Hsieh (2004) for all portfolios. Discuss your results. In particular, how do exposures (and their significance) change in time? □

Question 8: Is explanatory power stable for the two models from previous question? If not, in which market conditions the models perform worse? What are the implications of your findings on fund/manager selection? □

[1] Results for all Portfolios need to be included in your spreadsheets to obtain full credit for these questions.

[2] You may want to include appropriate figures to help get your point across.