Investments: Homework 9

1 Dimensional Fund Advisors, revisited

Dimensional Fund Advisors (DFA) is a Santa Monica money management firm. Among many of their U.S. equity strategies, the "9-10 Small Company Strategy" invests in securities of U.S. companies whose market capitalization is in the size range of deciles 9 through 10 of the NYSE (bottom 20 percentile). Their second main strategy is the "US 6-10 Value Portfolio", which invests in securities of U.S. companies whose book-to-market ratio falls in the 6 to 10 deciles of the NYSE (above the median).

The strategies' NASDAQ symbols are dfscx and dfsvx respectively. The dataset for this assignment is HW9_DATA.xls. It contains monthly returns on the DFA small cap fund (dfscx) and the DFA value fund (dfsvx), along with returns on the market portfolio, the 2 Fama-French Factors SMB and HML, Carhart's "Momentum" factor and the risk-free rate. The sample ranges from January 1982 to January 2009, except for the value fund which was conceived in April 1993.

1. Identify the two worst performing months for dfscx and dfsvx respectively, as well as its two best performing months. During these extreme months, what happened to the market portfolio? What happened to the SMB, HML, and Momentum portfolios?

2. Over the entire sample, how does dfscx and dfsvx perform in comparison with the market portfolio? Report the mean (in excess to the riskfree rate) and the standard deviation of dfscx and dfsvx, and compare them with those of the market portfolio. Does DFA's small company and value strategies have a higher Sharpe Ratio than the market portfolio? Report your numbers in annualized terms.

3. Lets try to explain the monthly realized returns R using the four empirical factors we examined in Part 1

$$R_{i,t} - R_{f,t} = a + b_i(R_{M,t} - R_{f,t}) + s_i R_{SMB,t} + h_i R_{HML,t} + w_i R_{MOM,t} + u_t$$

where a is the intercept,b, s, h, and w are the regression coefficients measuring the sensitivity of the "9-10 Small Company Strategy" or the "6-10 Value Portfolio" to the four empirical factors. Run the above multi-factor regression using Stata. Use your regression results to answer the following questions.

4. Given that dfscx follows a small cap strategy, one would assume that s is a very significant number. Can you confirm that? Also, given that dfsvx is supposedly following a value strategy, one would expect that h would be statistically significant. Is it true?

5. Is there any evidence that either fund follows the "Momentum" strategy?

6. Overall, how much variation of each funds return can be explained by the four empirical factors?

7. Does either fund provide any statistically positive (or negative) excess return that cannot be explained by the four empirical factors?

8. Compute Jensen's alpha and the Appraisal Ratio for DFA's small cap and value strategies. Which of the two funds (if any) would you recommend to investors? Would your answer change if these investors were otherwise restricted to hold the market portfolio?