Homework 5

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In this assignment, you will see how to benchmark the performance of a proposed trading strategy against the 3-factor Fama and French model. The strategy is to buy the stocks of firms that are *not* rapidly growing their book asset values. The higher returns earned by the stocks of slow-growing firms is sometimes called the "asset growth anomaly."

Download from Canvas the spreadsheet "Homework 5 data.xlsx". It has two sheets with data on various investment returns from 1973 through 2023:

The first sheet, "Portfolio excess returns," lists monthly excess returns on stock portfolios that are designed to capture the asset growth anomaly. Every June, public stocks are sorted into one of five portfolios. Portfolio 1 contains the stocks that have the *lowest* asset growth rates, and Portfolio 5 contains the stocks that have the *greatest* asset growth rates. The spreadsheet reports the monthly, value-weighted total return, in excess of the risk-free rate, on each portfolio of stocks.

The second sheet, "Fama-French factors," shows monthly returns to the three factor portfolios of Fama and French. These are: (1) the excess return of the value weighted market portfolio over the risk-free rate of return; (2) the "small minus big" factor (SMB); (3) the "high minus low" market-to-book factor (HML). For an explanation of these factors, see our class notes and Section 13.3 of the textbook.

Use the data to answer the following questions:

1) Calculate the average monthly excess return to each of the five portfolios in the first worksheet.
   - What is the difference in average monthly returns between portfolios 1 and 5?
   - Why is this not enough to convince us that an investor would have benefited from trading on the asset growth anomaly during the time period covered by our data?

2) Calculate the Sharpe ratio for each of the five portfolios.
   - What is the general pattern of Sharpe ratios across the portfolios?

3) Calculate the beta and alpha of each portfolio with respect to the Fama-French market factor.
   - What is the general relationship, if any, between the CAPM expected excess return, and the actual average excess return of the five portfolios? What is the difference in CAPM alpha between portfolios 1 and 5?

4) Calculate the factor loadings of each portfolio on the three factors of the Fama-French model. Use these loadings to calculate the expected excess return of each of the five portfolios.
   - What is the general relationship between the expected excess return, and the actual average excess return, across the five portfolios? What is the difference in the 3-factor alpha between portfolios 1 and 5? How should an investor respond to this information?