Final Project

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November 9, 2021

Introduction

Project must be typed and delivered as one pdf file that includes the report with all the analysis and plots. The report should start with a header section containing sector name, report title, name, and report date. All relevant plots and tables must be incorporated in the body of the report along with analysis for the various questions. The appendix section of the report should contain the python codes and any other resources used in the analysis. Any resources used in generating report and accompanying analysis should be acknowledged in the appendix section. The pdf report file must be emailed to me on or before the due date.

Project

Choose 5 industries (or subindustries, for oil and REIT) from your sector and perform the following analysis, using all common stocks from S&P500 during the sample period of 2001 - 2020:

1. Provide a list and brief description of the 5 selected industries (or subindustries) along with the number of companies and average, median, min, and max market capitalization of the companies in each of those 5 industries.

2. Compute the equal-weighted index returns (EW) for each of the selected industries.

Provide a table with the annual return, annual volatility, and Sharpe Ratio of each of these indexes. Plot the (cumulative) returns of these indexes using python, and include the total equal-weighted market index.

3. If you want to construct long-short strategy between two of your five industries in the last 5 years, using the EW indexes constructed in #2, what industry would you choose for the long side, and which industry would you choose for the short side? Construct the long-short portfolio return with monthly rebalancing and run the Fama and French model. Explain the alpha, and whether it is significant at the 5% level, and analyze whether the factor loading on the market factor, the size factor, and value factor make sense.

4. For each of the selected 5 industries (subindustries), split the companies into two equal groups by market capitalization, and compute a Large Cap (LC) and Small Cap (SC) value-weighted index returns. Provide a table with the correlation of the large cap and small cap index returns with the equal-weighted (EW) index returns computed in #2 for each of your five industries. Does the LC or SC index has a higher correlation with the EW index? Why?

5. Using the LC and SC indexes computed in #4, construct the [SC-LC] long short portfolio with monthly rebalancing for each industry, and run the Fama-French three factor model of these long short portfolios using the returns of the last 5 years. Provide a table with the annual return, annual volatility, Sharpe Ratio, and the Fama and French model output of each of these indexes. Which industry has the highest size premium? Is it significant at the 5% level?