Spring 2022

Project #1 (Due: March 20, 2022)

Consider that you are an analyst and you need to estimate the CAPM 'Beta' and 'Alpha' of stocks of a corporation/portfolio. First, you pick any corporation you want to investigate.

1) **Collect price information of 'your stock' and stock market (S&P 500 index) from Yahoo Finance for the past 5 years, 15 years, and 30 years. Note that you have price information – not returns – calculate returns (in Gretl or any other programming language that supports "econometrics") before you do anything since the CAPM is all about stock returns. Using Gretl or any statistical package calculate parts i) through iv) below. Risk-free returns can be downloaded @ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html**

   Comment on your results.

I. **Average Excess returns, which is defined as (returns of a stock - (risk-free) returns)**

II. **Sharpe-ratio, which is Mean/Standard deviation of excess returns.**

III. **Beta, which is the coefficient of the explanatory variable**

IV. **Alpha, the constant term in regression/OLS**

V. **Comment on whether your estimates are correct (check for 'beta' that you can find in Yahoo Finance to compare).**

Since you are estimating everything for the past 10, 20, and 30 years, show your calculations 3 times in a tabular form.

2) **Now consider that you are a portfolio manager and you have $1 million to invest, and hence you want to diversify the risk of owning 'your stock'. Pick any number of stocks (10 minimum) you want to create an equally weighted stock portfolio of stocks and calculate parts i) through iv) above for the portfolio. Comment on your results.**

Since you are estimating everything for the past 10, 20, and 30 years, show your calculations 3 times in a tabular form. Importantly, make sure you have 30 years of data for all 11 stocks.

3) **How did your portfolio perform during the recent crisis – August 2008 through March 2009?**

4) **Now add a risk-free bond to your portfolio. Assume that you are a risk-averse manager, and you want 40% of $1 million invested in risk-free rates and the rest (60%) in the stock portfolio you created in #3. Did the portfolio perform better than the "stocks" only portfolio during the 2007-2009 crisis?**

5) **Now go back to Fama-French website – use the Rm-RF (not the market risk premium you have calculated in step 1) given by those authors and redo Question #2.**

HINTS:

1. **Download data for 30 years, and then use the sample function of gretl to make it 10, 20, 30 years.**
2. **Use Gretl function %change to calculate returns of stocks using the price information.**
3. **Use gretl functions to calculate anything you need. Don't use Excel.**
4. **Read the entire project, figure out what data you need before you import anything to gretl. This will save you lots of time and headache.**