



MS IN BUSINESS ANALYTICS
BA 692 – INVESTMENT THEORY/ADVANCED CORPORATE FINANCE
Professor Sury

PROJECT 1

Due: Tuesday 10/26/21, 315pm to Canvas

SECURITY CHARACTERISTIC LINE (TIME SERIES REGRESSION) (10 points)

Select a stock of your choosing and produce a Security Characteristic Line (SCL) and its pertinent output (e.g., ANOVA)—all in an automated procedure, using Python programming.

This will require you to run a time series regression of the risk premium of the stock versus the market risk premium. You may use whichever market proxy you wish. Do not forget what the definition of risk premium is! The time period should be 5 years of returns (ending 12/31/2021). For now, we'll use monthly data.

There are a variety of places to look for data that you can automatically download via Python. The one that you should become most familiar with is WRDS/CRSP/Compustat (we'll be using these extensively later this term and in the Fall). Start looking for documentation on this now. If you are having difficulty with automatically downloading from that database, then you can do it via Yahoo Finance or other websites for now—there are a variety of code samples on the web to show you how to do this.

Another useful place to look for data is in Ken French's Data Library, located here:

https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

Note: this library contains information for "Rm-Rf," so check the footnotes to make sure how they define Rm and Rf to make sure that you are consistent in any other areas of your analysis.

Whenever you use data from somewhere, make sure you cite your sources in your report output.

Once you have collected all your data, you will need to run the regression. Once again, this should be done in Python (though you will naturally be relying on certain packages/libraries to run it). Make sure that your program *also* evaluates the regression to test for validity (don't forget the regression assumptions, such as linearity, independence of residuals, homoskedasticity, etc.).

Your automated report should provide the following in a nice/presentable format:

- A graphic illustration of the SCL
- Summary Statistics (e.g., number of obs., correlation, R², Adj. R², Standard Error of Regression)
- ANOVA Table (somewhat similar to how it would look in Excel output).
- Hypothesis test of alpha (against appropriate null hypothesis); indication of statistical significance
- Hypothesis test of beta (against an appropriate null hypothesis); indication of statistical significance

OPTIONAL: A better submission would query a user to input a certain ticker symbol, market proxy, time horizon, frequency (e.g., daily, weekly, monthly) and then run the analysis—thereby allowing anyone to use your program for a stock of their choosing.

Be prepared to present your program to the class. Random teams will be selected to showcase their program at the beginning of class. Don't forget to use proper documentation in your code.

Turn in your code (.pynb) and output (.pdf) to Canvas, under Assignments by the deadline.