

**Investment Analysis  
Business 3273  
Fall 2020**

**Modelling Assignment 3: Return Generating Models**

**Due: 12:00 PM (noon) on Sunday, November 22<sup>nd</sup>**

Note: This assignment uses the Excel data file titled Modelling Assignment 3 Data File.xlsx found on ACORN. In addition to this data file, you will also need to download information from Kenneth French's Data Library at Tuck School of Business at Dartmouth College, found [here](#).

**Assignment Set Up**

To begin this assignment, you are required to narrow down the Data File on ACORN. To accomplish this:

1. Select ten stocks from the Data File such that there are five US equities and five non-US equities. Note that you will need both the monthly and daily returns for each firm, which are found on two separate tabs in the Data File.
2. Select a random time-period that is at least five years in length (i.e., at least 60 monthly returns).

**Model 3a: Test of the Capital Asset Pricing Model (CAPM) for Monthly vs Daily Data**

For each of your ten securities, you will need to run the Market Model twice:

1. Run the model for daily returns for your time period.
2. Run the model for monthly returns for your time period.
3. Summarize the pertinent information (refer to our lecture on October 29<sup>th</sup> for what that information is) from these 20 regressions in a table.
  - i. Your data should be grouped (with averages) by frequency (i.e., daily and monthly).
  - ii. Your regression results will be output on to a new tab by Excel. Label these tabs appropriately (e.g., CAPM-D-ABC for the CAPM regression using daily data for a company with a ticker of ABC).
  - iii. Hide (do not delete) the output tabs for these 20 regressions.
4. Statistically test if the CAPM has more explanatory power in modelling daily or monthly security returns over your chosen time period. Be sure to clearly indicate which statistical test you used in determining this.

### **Model 3b: Test of the Fama-French Three Factor Model (FF3) vs the Carhart Four Factor Model (C4)**

For **daily returns only**:

1. Regress the returns of your ten securities on the three risk factors of the Fama-French Three Factor Model.
2. Regress the returns of your ten securities on the four risk factors of the Carhart Four Factor Model.
3. Summarize the pertinent information from these 20 regressions in a table.
  - i. Your data should be grouped (with averages) by model employed (i.e., FF3 and C4).
  - ii. Your regression results will be output on to a new tab by Excel. Label these tabs appropriately (e.g., FF3-ABC for the FF3 regression for a company with a ticker of ABC).
  - iii. Hide (do not delete) the output tabs for these 20 regressions.
4. Statistically test which of the two models has more explanatory power in modelling daily security returns over your chosen time period. Be sure to clearly indicate which statistical test you used in determining this.

### **Model 3c: Test of the Predictive Power of the Fama-French Five Factor Model (FF5)**

For **monthly returns only**:

1. For this test of your return generating model, you will need to subdivide your chosen time-period as follows:
  - i. Your model calibration period will exclude the most recent six months of returns.
  - ii. Your model testing period will be the most recent six months of your chosen time period.

For example, if your time period is from January 2010 to October 2020, your calibration period would be from January 2010 to April 2020 (inclusive) and your testing period would be from May 2020 to October 2020 (inclusive).

2. Regress the returns of your ten securities on the five risk factors of the Fama-French Five Factor Model for the calibration period.
3. Summarize by security the pertinent information for each of these regressions in a table.
4. Name and hide the regression output tabs in a similar fashion as in the two prior models.
5. For each of the ten securities, determine the monthly Jensen's Alpha for each of the six months in the testing period.
6. Display each of these monthly values as well as the annualized Jensen's Alpha, by security, in a table.
7. Finally, determine if the FF5 has more explanatory power in explaining US or non-US securities over the calibration period.