

**BA870: Individual Project - April 2022**  
**“Financial and Accounting Analytics of Stock Returns  
During Market Shock of Early 2022”**  
**Due: Wednesday, April 27 at 5:00pm**

**Requirements:**

- (1) Undertake a financial/accounting analysis of a large set of U.S. companies during the “**Stock Market Shock**” of Early 2022 (January – March 2022).
- (2) You should use the sample of companies provided in Assignment #4 (the CSV file with the tickers from the Russell 3000 companies).
- (3) Your individual project must be programmed in Python in a Colab Notebook. Your Notebook code must be fully documented (using Markdown text boxes). You may attach any additional supporting files (such as CSV input files). You must submit your executed Colab Notebook and a PDF of your complete Notebook with executed code and output.
- (4) Prepare a 10-minute presentation with slides (PPT or Google slides) to present in Lecture #12 or #13.
- (5) Your completed project (Notebook: ipynb and pdf) and presentation slides (ppt) must be submitted on **QuestromTools** by 5:00pm on Wednesday, April 27, 2022 (**Submit in the ASSIGNMENTS Tab**).

**Grading:**

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|--|------------------|
| - Colab Notebook Code:   | 200 points       |
| <ul style="list-style-type: none"><li>○ Correctly executed code</li><li>○ Complete analysis of determinants of stock returns</li><li>○ Innovative and/or compact code</li><li>○ Use of graphs, plots and other summarization methods</li></ul>   |                  |
| - Colab Notebook Documentation in Text Boxes:  | 150 points       |
| <ul style="list-style-type: none"><li>○ Detailed description of each block of code</li><li>○ Explanation and interpretation of the results<ul style="list-style-type: none"><li>▪ Detailed statistical explanations of variables</li><li>▪ Detailed economic interpretation of results</li></ul></li></ul> |                  |
| - Presentation Slides (10 slides):   | 75 points        |
| <ul style="list-style-type: none"><li>○ Concise and understandable slides</li><li>○ Use of graphs, charts &amp; tables to summarize results</li><li>○ Slide design</li></ul>   |                  |
| - Presentation to Class:   |                  |
| <ul style="list-style-type: none"><li>○ Clarity, on schedule, answering questions</li></ul>  | <u>75 points</u> |

**TOTAL:**                      **500 points**

## Steps:

### (1) Collect data for your project based on ticker symbols from the Russell 3000 index:

- a. The set of stocks will be provided in a **CSV** file with the list of ticker symbols. It will be posted with Assignment #4 on QuestromTools ("**ProjectTickers.csv**").
- b. Collect monthly stock return data from January 2017 - December 2021 (60 months) for each of the stocks with tickers in the file "**ProjectTickers.csv**". The monthly stock returns can be downloaded from CRSP on the WRDS database (see Assignment #3). Save these stock returns in a CSV file labelled "**Project-2017-21>Returns.csv**".
  - i. You will also use the "Fama-French" factor returns data from Assignment #3.
- c. Collect Financial Report data for the year 2021 for each of the stocks with tickers in the file "**ProjectTickers.csv**". The Financial Report data can be downloaded from Compustat on the WRDS database (see Assignment #4). Save these stock returns in a CSV file labelled "**Project-2021-Financials.csv**".
- d. Collect Industry Identifier data for the year 2021 for each of the stocks with tickers in the file "**ProjectTickers.csv**". The Industry data can be downloaded from Compustat on the WRDS database (see Assignment #5). Save these stock returns in a CSV file labelled "**Project-2021-Sector.csv**".

### (2) Determine Risk Exposures

- a. Similar to Assignment #3, calculate the Fama-French Risk Exposures for the list of 3,000 tickers for (i) Market Risk Exposure; (ii) Size Risk Exposure; and (iii) Value/Distress Risk Exposure.
- b. Save the ticker symbol and the 3 exposure values for each stock in the list in a CSV file labelled "**FF-Exposures.csv**".

### (3) Calculate Financial Ratios

- a. Based on the Lectures in BA870, calculate relevant financial ratios (including market ratios) that you believe might explain a company's stock return in early 2022.
- b. You should calculate **at least** 10 ratios (including at least 2 market-based ratios) to use in your analysis.
- c. Use the methods from Assignment #4 to help you collect and calculate the financial ratios.
- d. Ensure that you correctly deal with missing values and outliers.
- e. Calculate Save the ticker symbol and the 10+ financial ratios for each stock in the list in a CSV file labelled "**Fin-Ratios.csv**".

### (4) Industry Indicators

- a. Using the methods outlined in Assignment #5, determine industry indicators for each stock in the list.

- b. Save the ticker symbol and the industry indicators for each stock in the list in a CSV file labelled “**Industry.csv**”.

(5) Run OLS explanatory for 4 categories:

a. Risk Regressions:

- i.  $Ret(i) = a + b1*MktExposure(i) + b2*SizeExposure(i) + b3*ValueExposure(i) + e$

- ii. Interpret and explain your findings (focus on R2, Adj R2 and coefficients)

b. Financial Characteristics:

- i.  $Ret(i) = a + c1*Ratio1(i) + c2*Ratio2(i) + \dots + c10*Ratio10(i) + e$

- ii. Interpret and explain your findings (focus on R2, Adj R2 and coefficients)

c. Industry Dummies:

- i.  $Ret(i) = a + coefficients*IndustryDummies + e$

- ii. Interpret and explain your findings (focus on R2, Adj R2 and coefficients)

d. Combined Regressions:

- i. *Combine the various regressions in steps (a-c) above.*

- ii. Interpret and explain your findings (focus on R2, Adj R2 and coefficients)

(6) Document, interpret and explain your code and results in detail using extensive text boxes and graphs in your Colab Notebook.