

202230\_2 Spring 2022 Sem...

- Home
- Announcements
- Assignments
- Discussions
- Grades
- People
- Files
- Syllabus
- Quizzes
- Modules
- Collaborations
- New Analytics
- Zoom Meetings
- Leganto Course Materials
- Microsoft Teams Meetings

## Solo Project

Start Assignment

Due

May 4 by 11:59pm

Points

100

Submitting

a file upload

File Types

pdf and ipynb

2022-03-31 – Revision 1

- Use the monthly returns on value-weighted portfolios in element 0 of the pandas-datareader dictionary
- The portfolio weight on RF should fall between -1 and +1, inclusive
- The portfolio weights on BE/ME portfolios should fall between 0 and +1, inclusive
- The portfolio weights should sum to 1.

## Assignment

Can you replicate the total return of Warren Buffett's Berkshire Hathaway with Ken French's ten portfolios formed on book-to-market equity plus leverage? Find portfolio weights of the minimum variance portfolio with the same total return as Berkshire. Examine how your portfolio weights change before and after the 2007-2008 financial crisis, and compare your portfolio to Berkshire along at least five performance measures (e.g., alpha and betas, Sharpe ratio, and others). Discuss what these results suggest about the repeatability of and changes in Berkshire's investing style.

## Data Details

- Use all available monthly returns data from the following three sources:
  - Use Yahoo! Finance's ticker BRK-A for Berkshire, which is available from 1980
  - Use Ken French's "F-F\_Research\_Data\_Factors" for your benchmark factors and risk-free rate
  - Use Ken French's "Portfolios\_Formed\_on\_BE-ME" for your ten decile portfolios formed on book-to-market equity (i.e., "Lo 10" through "Hi 10" from the monthly returns on value-weighted portfolios in element 0 of the pandas-datareader dictionary)
- Constrain your portfolio weights as follows:
  - You can borrow at Ken French's risk-free rate RF, but the portfolio weight on RF should fall between -1 and +1, inclusive you may not exceed a debt-to-equity of 1 at the beginning of any month
  - You may not short any of the ten decile portfolios formed on book-to-market equity
  - The portfolio weights on BE/ME portfolios should fall between 0 and +1, inclusive
  - The portfolio weights should sum to 1
- Consider 2007 and before as before the financial crisis, and consider 2008 and after as after the financial crisis

## Report Components

- Introduction and conclusion that summarize your arguments and conclusions
- Calculate and discuss your portfolio weights
  - How do your portfolio weights differ before and after the financial crisis?
  - What do these changes say about changes in Berkshire's investing style?
- Calculate and discuss the performance of your portfolio against Berkshire before and after the financial crisis
  - Compare at least five performance measures (e.g., alpha and betas, Sharpe ratio, and others) to guide your discussion
  - In addition, for Berkshire only, calculate these five performance measures with five-year rolling windows
  - What do these calculations suggest about the repeatability of and changes in Berkshire's investing style?

## Report Submission

You will provide your writing and analysis in one Jupyter Notebook and submit two files to Canvas:

- One Jupyter Notebook file
- One PDF export of your Jupyter Notebook (i.e., File > Save and Export Notebook As... > PDF in Jupyter Lab)

## Additional Guidance

- Your notebook must run on my computer
  - Your notebook must be self-contained and not rely on other files
  - You must tell me how to install any packages we have not used in class
- Your PDF must not exceed 15 pages in length
  - I want to encourage you to be clear and concise and to omit unnecessary print-outs
  - Your co-worker, boss, or client is unlikely to read a 30-page report
- Your PDF must have the same format that I post to Canvas (i.e., File > Save and Export Notebook As... > PDF in Jupyter Lab)
  - This is the only PDF format that I can reliably read and annotate on Canvas
  - You can set the title in the Jupyter Notebook metadata
- Your goal is to convince me of your conclusions!
  - Clearly labeled figures are typically more convincing than print-outs
  - I will not penalize code that provides the intended results, but clean code is more convincing than messy code
  - I will not penalize writing for minor errors, but clear writing is more convincing than messy writing

Group Project 2 Rubric			
Criteria	Ratings		Pts
Introduction and conclusion that summarize arguments and conclusions	10 pts Full Marks	0 pts No Marks	10 pts
Calculate and discuss portfolio weights	30 pts Full Marks	0 pts No Marks	30 pts
Compare Berkshire against portfolio, before and after financial crisis, along five performance measures	25 pts Full Marks	0 pts No Marks	25 pts
For Berkshire only, calculate these five performance measures with five-year rolling windows	25 pts Full Marks	0 pts No Marks	25 pts
Notebook runs on my computer	4 pts Full Marks	0 pts No Marks	4 pts
PDF does not exceed 15 pages	3 pts Full Marks	0 pts No Marks	3 pts
PDF is in the correct format	3 pts Full Marks	0 pts No Marks	3 pts
Total Points: 100			