

2023 MSBA 5511 Financial Analytics
Final exam

Moodle submission (WORD, EXCEL)

Write down your answers to this WORD document. No grades if you did NOT write down your answers clearly on this document.

Please also submit EXCEL, and/or SAS codes. From SAS Studio, Email SAS CODE, SAS LOG, SAS RESULTS to xiaotian.zhang@dominican.edu and cc yourself.

Due by Wednesday May 3, midnight.

Name: Jackie Ocaña

Academic dishonesty is a serious violation of Student Code of Conduct. This exam is an independent exam. If you have any questions, please ask the professor, Dr. Tina Xiaotian Zhang via email: xiaotian.zhang@dominican.edu. You are not allowed to discuss the exam with your classmates.

1. Portfolio Optimization (80 points)-you can use SAS and/or Excel for the questions.

Go to Google Drive, download the excel file of “Final_optimization_bac_msft_student”.

The Excel has the daily adjusted stock price of Bank of America (BAC) and Microsoft (MSFT) from Jan 2016 to Feb 2017.

Suppose that the average 30-day Treasury bill rate from Jan 2016 to Feb 2017 was 0.4%, and the average investment grade corporate bond yield from Jan 2016 to Feb 2017 was 3%.

Questions:

- 1) Report the mean and standard deviation of daily stock returns of BAC and MSFT. (5 points)

Mean = 0.001648905

Std = 0.0195749327

- 2) Report the correlation and covariance between BAC and MSFT' daily stock returns. (5 points)

0.0001039719 = covariance

0.39180 = correlation

3) Optimization.(60 points)

- a. If the target return is 0.001, what is the optimized portfolio that has the lowest risk (measured by portfolio's standard deviation) given the rate of return?

BAC Weight: 0.28593

MSFT Weight: 0.71407

Portfolio STD: 0.0129418778

- b. You choose four reasonable target rates of return. What is the optimized portfolio that has the lowest risk (measured by portfolio's standard deviation) given the rate of return?

Target rate of return 1: 0.0001

BAC Weight: -0.70444

MSFT Weight: 1.70444

Portfolio STD: 0.0217800964

Target rate of return 2: 0.00001

BAC Weight: -0.80348

MSFT Weight: 1.80348

Portfolio STD: 0.0233194232 (my_sqrt_value)

Target rate of return 3: 0.00009

BAC Weight: -0.71544

MSFT Weight: 1.71544

Portfolio STD: 0.0233194232

Target rate of return 4: 0.0002

BAC Weight: -0.5944

MSFT Weight: 1.5944

Portfolio STD: 0.0201369312

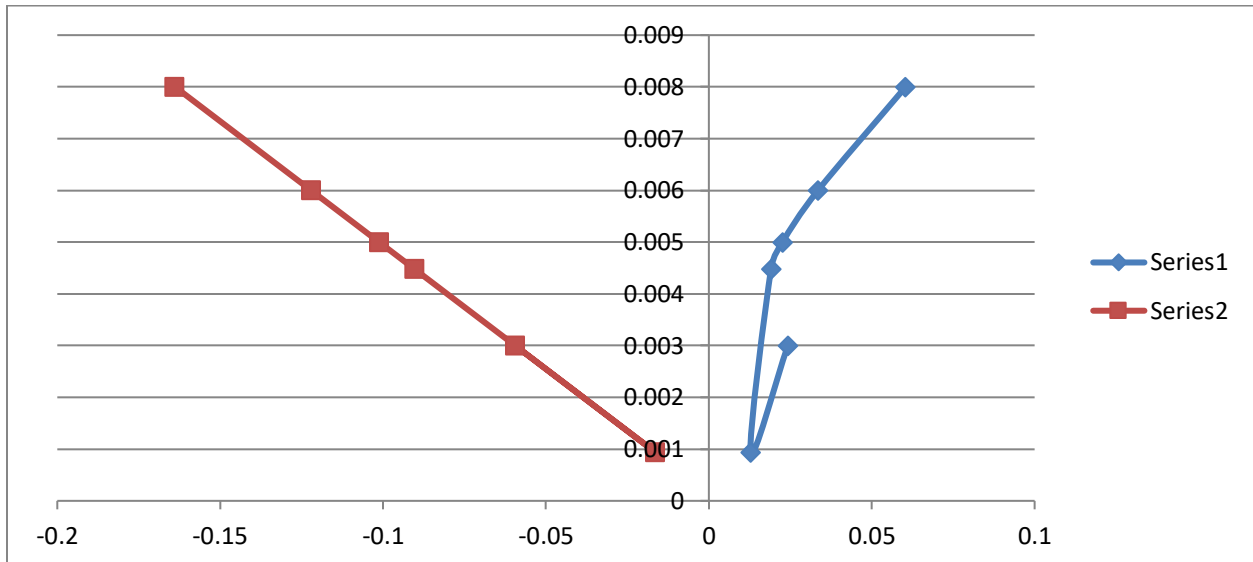
- c. What is the optimized portfolio that has the global lowest risk (measured by portfolio's standard deviation)?

BAC Weight: 0.2222924
MSFT Weight: 0.7777076
Portfolio STD: 0.012863421
Portfolio return: 0.00094

- d. What is the optimized portfolio that has the highest Sharpe Ratio?

BAC Weight: -18590377
MSFT Weight: 18590378
Sharpe Ratio: -0.047878157
Portfolio STD: 351640.5221
Portfolio return: -16835.89991

- 4) Draw the graph, illustrating the min-variance frontier, efficient frontier, global min-risk portfolio and tangent portfolio (the Capital Allocation Line). (10 points)



2. Fama-French Three-Factor Model (20 points)

The regression for Fama-French 3-Factor model is as follows.

$$R_{i,t} - R_{F,t} = \alpha + \beta_1(R_{M,t} - R_{F,t}) + \beta_2SMB_t + \beta_3HML_t + \varepsilon_{i,t}$$

Use the daily stock return data of Microsoft from Jan 2016 to Feb 2017 (the same data as the Question 1).

Data: Final_optimization_bac_msft_student

Use the Fama/French 3 Factors [Daily Data] from

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

Data: F-F_Research_Data_Factors_Daily_CVS

Report the regression output:

| | Microsoft |
|--------------------------|------------|
| Intercept | 0.00047777 |
| P value of Intercept | 0.4325 |
| Coefficient of X1(RM-RF) | 1.31749 |
| P value of X 1 | <.0001 |
| Coefficient of X2 (SMB) | 0.51726 |
| P value of X2 | <.0001 |
| Coefficient of X3 (HML) | -0.56832 |
| P value of X3 | <.0001 |
| No of Observations | 251 |
| Adj R Square | 0.5563 |

- What is Microsoft's beta value based on this estimation?
1.31749
- At the significance level of 10%, which statement is correct?
 - The stock is predominantly a growth stock.
 - The stock is predominantly a large-cap stock.
 - All of the above.
 - None of the above.**
- At the significance level of 10%, does the analysis find an alpha for the Microsoft stock?
 - Yes
 - No**
 - Not sure

University's Course evaluations are open until May 3. Please fill the course evaluations. If the student response rate is 100%, I will give a bonus credit of 0.25 to everyone. Thank you.

Mandatory Self and Team evaluation.

Your name:

List your team members ___Rana, Kohsuke, Rahmat_____

Scale of 1-10: 1 is very bad and 10 is very good.

1. How do you describe your contribution (and score) to your group assignments and the PI group project?

Score: 10, I tended organize the group together to get work going before the due dates.

Work made it difficult to always meet with one another, but always found a way to get up to speed.

2. Team member1 name: ___Rana_____

How do you describe the contribution (and score) of TEAM MEMBER 1 to your group assignments and the PI group project?

Score: 10

Always volunteered for parts to do, stayed engaged in group chat.

3. Team member2 name: ___Kohsuke_____

How do you describe the contribution (and score) of TEAM MEMBER 2 to your group assignments and the PI group project?

Score: 10

Always lent a hand helping me with my code for projects, finished his contributions early and answered questions from the team.

4. Team member3 name: ____Rahmat_____

How do you describe the contribution (and score) of TEAM MEMBER 3 to your group assignments and the PI group project?

Score: 9

There were times when he would not communicate/inform us of what was going when. When contributed he contributed good work.

5. Team member4 name: ____N/a_____

How do you describe the contribution (and score) of TEAM MEMBER 4 to your group assignments and the PI group project?

Score: N/a

6. Any Feedback, always welcome. Stay in touch. I'd like to know your successful story. Please feel free to contact me if you have questions about Finance.

Would love to connect with you on LinkedIn to stay in touch ☺ Your class was engaging even when topics were difficult. Felt you were open as a professor to any questions I may have had throughout the course.

<https://www.linkedin.com/in/jacquelineocana/>