Final exam

William Mann, Emory University, Fall 2022

Please print your name on the line below:

_____answer key_____

- There are 15 multiple choice questions. These have **only one answer**.
  Mark your answer clearly in the box next to the question.
- There are 10 computation questions. For these, the answer is **always a number**.
  Write it in the line under the question. I will not check your work.
- You can bring one page of notes, front and back.
- You should bring a calculator, but it should not have wireless capability.

I. Short sales and market-neutral strategies

Question 1: Suppose you short-sell one share of a stock that is currently trading for $100. You leave the proceeds from the short sale as cash collateral for this trade, and you also deposit another $50 cash collateral. Then the stock price rises to $150. How much extra collateral would you need, to reach the Reg T *maintenance margin* requirement?

<u> $45   </u>

Question 2: In the previous question, if you do not add sufficient collateral to your position, your broker will use the cash in your account to close out the short position. How much money will you then have lost on the trade, as a dollar amount?

<u> $50   </u>

Here is a simplified balance sheet for a dollar-neutral fund like the ones we talked about in class. Refer to it for questions 3, 4, and 5.

Assets

Investments in securities, at value	$300m
Cash collateral for short positions	$300m
Liabilities	
Securities sold short, at value	$300m
Net assets	$300m

Question 3: How much capital would be required from investors to set up a fund with this balance sheet?
- ☐ A) $300m
- ☐ B) $600m
- ☐ C) $900m
- ☐ D) $1200m

Question 4: In the balance sheet above, the cash collateral for short positions is much less than the standard margin requirements under Reg T. What is the usual explanation?
- ☐ A)   The fund is not reporting its short positions at market value.
- ☐ B)   The fund is in violation of its margin requirements.
- ☐ C)   The fund is exempt from any margin requirements.
- ☐ D)   The fund has pledged shares of stock as additional collateral.

Question 5: Suppose that the fund's balance sheet matches the numbers listed above at the start of the year. Then, during the following year,
- the stocks that the fund purchased long earn a total return of 5%;
- the stocks that the fund sold short earn a total return of 1%;
- the fund receives interest income of 2% on its cash collateral.

Ignoring other fees and expenses, what return will the fund generate for its investors?
- ☐ A) 5%
- ☐ B) 6%
- ☐ C) 7%
- ☐ D) 8%

II. Factor models

For questions 1 through 4, use the table below, which provides some returns in a specific year on the portfolios that you create when calculating SMB and HML:

$$S/L = 0\% \quad S/M = 4\% \quad S/H = 5\%$$
$$B/L = 0\% \quad B/M = 3\% \quad B/H = 3\%$$

Question 6: What is the value of HML during this year?

$$\underline{\hspace{3cm}4\%\hspace{3cm}}$$

Question 7: What is the value of SMB during this year?

$$\underline{\hspace{3cm}1\%\hspace{3cm}}$$

Question 8: Which of the following *could* be the market return during this year?
- ☐ A) -6%
- ☐ B) 0%
- ☐ C) 3%
- ☐ D) 6%

Question 9: Would a long-only or dollar-neutral strategy for value investing deliver better performance for an investor during *this particular year*, after costs, and why?
- ☐ A) **Dollar-neutral**, because it would be cheaper without sacrificing returns.
- ☐ B) **Dollar-neutral**, because it would benefit from short-selling growth stocks.
- ☐ C) **Long-only**, because it would be cheaper without sacrificing returns.
- ☐ D) **Long-only**, because it would benefit from short-selling growth stocks.

Question 10: In the Fama/French approach to tracking factor performance, you form stock portfolios in June of each year, not January. The reasoning behind this was only important for one of the factors listed below. Which one was it?

☐ A)   HML (value)
☐ B)   SMB (size)
☐ C)   UMD (momentum)
☐ D)   CMA (defensive)

Question 11: Which of the following can we say about UMD, the Fama-French measure of the performance of the momentum strategy?

☐ A)   It is designed to be neutral against value, size, and the market.
☐ B)   It is designed to be neutral against value and size, not against the market.
☐ C)   It is designed to be neutral against the market and value, not against size.
☐ D)   It is designed to be neutral against the market and size, not against value.

For questions 12 through 14, use the table below, which reports the results of a Fama-French regression analysis for a specific strategy using annual returns from 1975–2020:

α (alpha)	β_M	β_{SMB}	β_{HML}
2%	1.1	0.2	0.3

Question 12: By how much per year did this investment outperform the excess return that would be predicted by the Fama-French model just based on its factor loadings?

2%

Question 13: If the average of HML in the data was 5%, then how much excess return did this investment earn per year, just from its connection with the value factor?

1.5%

Question 14: Suppose that you forecast a *future* market excess return of 10%, an SMB return of 5%, and an HML return of zero. What is the excess return that you would predict for this investment just based on its factor loadings?

12%

Question 15: Suppose you analyze a different investment during 1975–2020, and you find that all three of its factor loadings (betas) are positive and significant, but the intercept in the regression (alpha) is zero. Which of the following could you say?

☐ A) The investment **did not** outperform the CAPM benchmark in the data.

☐ B) The investment **did** outperform the CAPM benchmark in the data, but it will not continue to do so in the future.

☐ C) The investment **did** outperform the CAPM benchmark in the data, and this is completely explained by its loadings on SMB and HML.

☐ D) The investment **did** outperform the CAPM benchmark in the data, and this **is not** completely explained by its loadings on SMB and HML.

Question 16: Suppose you use the Fama-French model to analyze the performance of a long-only fund that focuses on holding tech stocks with high P/E ratios. Which of the following is most likely to be true about the results you would find?

☐ A) Strong **positive** loading on **SMB**.

☐ B) Strong **negative** loading on **SMB**.

☐ C) Strong **positive** loading on **HML**.

☐ D) Strong **negative** loading on **HML**.

Question 17: Thinking again about the fund in the previous question, what would you expect about its loading on the "market excess return" factor in the regression?

☐ E) Significantly below zero.

☐ F) Close to zero.

☐ G) Close to one.

☐ H) Significantly above one.

Question 18: Suppose you sort stocks each year into ten portfolios based on the ratio of earnings to enterprise value (EBIT/EV). Then you run separate Fama-French regressions for each of these portfolios. What pattern would you expect to find in the results?

☐ A) As the ratio increases, the **factor loading on HML** increases.

☐ B) As the ratio increases, the **factor loading on SMB** increases.

☐ C) As the ratio increases, the **factor loading on the market return** increases.

☐ D) As the ratio increases, the **regression intercept** increases.

Questions 19 through 25 relate to topics that we did not cover in Fall 2023.

END OF THE EXAM
Make sure your name is on the front page!