Past exam and quiz questions on the topics from Module 2 and Midterm #2:

<u>2019 exam</u>

16. Suppose you know that the Sharpe ratio of a new investment opportunity is lower than the Sharpe ratio of the other investments you already have. According to modern portfolio theory, what else would have to be true about this investment opportunity in order for you to take it?
    A) A high correlation with the returns of your other investments.
    B) A low correlation with the returns of your other investments.
    C) A market beta of greater than one.
    D) You would never take this investment.

You manage money for a risk-averse client. You can allocate their money between risky investments A and B with the information below:

Expected return on A:	10%
Expected return on B:	5%
Volatility of return on A:	20%
Volatility of return on B:	10%
Correlation between the returns:	0

Your client is only willing to accept a volatility of 10% in their portfolio. The risk-free rate is 4%.

18. Of the risky portfolios listed below, which would be the best to offer your client, taking into account that they will optimally allocate between this portfolio and risk-free saving?
   A) 100% allocated to A, 0% allocated to B.
    B) 60% allocated to A, 40% allocated to B.
    C) 40% allocated to A, 60% allocated to B.
    D) 0% allocated to A, 100% allocated to B.

19. Which of the following is **not** true about the portfolio you would choose in answer to the previous question?
    A) It has the highest Sharpe ratio of all risky portfolios.
    B) It generates the steepest capital allocation line (CAL).
    C) It is unaffected by the individual investor's risk aversion.
    D) It is unaffected by changes in risk-free rates.

24. What pattern did we see in class, for value stocks in the data since 1950, that supports value investing as a good strategy?
    A) Value stocks have higher returns than growth stocks, with no difference in betas.
    B) Value stocks have lower returns than growth stocks, with no difference in betas.
    C) Value stocks have higher betas than growth stocks, with no difference in returns.
    D) Value stocks have lower betas than growth stocks, with no different in returns.

Estimated relationship:
$r_{it} - r_{ft} = 1.08 + 0.79(r_{mt} - r_{ft})$
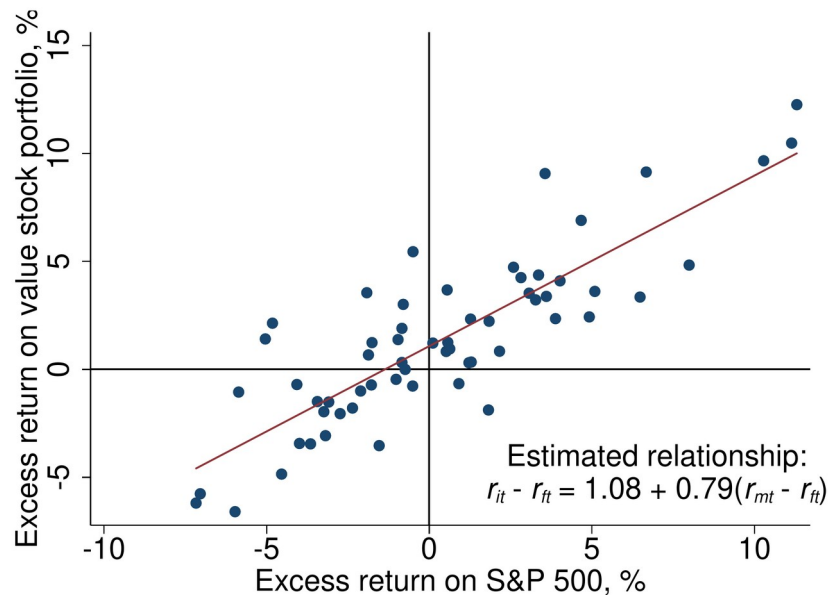
The figure above plots a best-fit line between the monthly excess return from 1981–1985 on two stock portfolios: on the vertical axis, a portfolio of value stocks, and on the horizontal axis, a value-weighted portfolio of S&P 500 stocks. The figure is set up the same as the figures we have looked at in class.

20. The number 0.79 says that the value stocks move, on average, …
   A) ...in the **same** direction as the S&P 500, but **not as far**.
   B) ...in the **same** direction as the S&P 500, but **farther**.
   C) ...in the **opposite** direction to the S&P 500, but **not as far**.
   D) ...in the **opposite** direction to the S&P 500, and **farther**.

21. Suppose the S&P 500 outperforms the risk-free rate by 5% in a given month. If we take the regression results above seriously, what is our best guess about how much the value stock portfolio would outperform the risk-free rate in the same month?
   A) 0%
   B) 1.08%
   C) 3.95%
   D) 5.03%

22. Suppose we think of the above figure as estimating the CAPM model for the return of the value stock portfolio. What assumption does the CAPM make about the average investor?
   A) They are risk-neutral with respect to changes in their wealth.
   B) Their wealth is entirely allocated to the value stock portfolio.
   C) Their wealth is partially allocated to the value stock portfolio, and partially to risk-free saving.
   D) Their wealth is partially allocated to the S&P 500 portfolio, and partially to risk-free saving.

23. In the figure above, which of the following tells us that the value stocks outperformed their CAPM benchmark return during this time?
   A) Some of the dots are very far from the line.
   B) The slope of the line is less than 1.
   C) The intercept of the line is positive.
   D) Most of the dots are in the upper-right part of the graph.

1. Suppose a new investment opportunity has *zero* correlation to your existing portfolio, that is $\rho = 0$. What should be your rule for evaluating this investment, according to the formula we saw in class?
    A) Invest if the Sharpe ratio is positive.
    B) Invest if the Sharpe ratio is greater than the Sharpe ratio of your existing portfolio.
    C) Invest if the Sharpe ratio is greater than the Sharpe ratio of *all* other available investments.
    D) You should never take this investment.

2. Suppose a new investment opportunity has *perfect* correlation to your existing portfolio, that is $\rho = 1$. What should be your rule for evaluating this investment, according to the formula we saw in class?
    A) Invest if the Sharpe ratio is positive.
    B) Invest if the Sharpe ratio is greater than the Sharpe ratio of your existing portfolio.
    C) Invest if the Sharpe ratio is greater than the Sharpe ratio of *all* other available investments.
    D) You should never take this investment.

3. Which assumption did we add to mean-variance analysis, in order to arrive at the CAPM? (In other words, which of the below statements applies to the CAPM but *not* to general mean-variance analysis?)
    A) Investors care about both the average return and the volatility of their portfolio.
    B) Investors think about the correlations between investment opportunities.
    C) Investors should not judge investments based *only* on their Sharpe ratios.
    D) Investors generally hold a market portfolio.

4. Suppose that the expected market return over the next year is $E[r_M] = 8\%$, and the risk-free rate over the next year is $r_f = 2\%$. According to the CAPM, what is the benchmark rate of return that you should require to take an investment with beta of 1.5 ($\beta = 1.5$)?
    A) Return of 11% (that is, excess return of 9% over the risk-free rate).
    B) Return of 8% (that is, excess return of 6% over the risk-free rate).
    C) Return of 6% (that is, excess return of 4% over the risk-free rate).
    D) Return of 2% (that is, excess return of 0% over the risk-free rate).

5. Suppose that the expected market return over the next year is $E[r_M] = 8\%$, and the risk-free rate over the next year is $r_f = 2\%$. According to the CAPM, what is the benchmark rate of return that you should require to take an investment with zero beta ($\beta = 0$)?
    A) Return of 11% (excess return of 9%).
    B) Return of 8% (excess return of 6%).
    C) Return of 6% (excess return of 4%).
    D) Return of 2% (excess return of 0%).

6. Which of the following should be part of the "market portfolio" according to the CAPM?
    A) Stocks
    B) Bonds
    C) Home values
    D) All of the above

7. Suppose an investment i has exactly the same volatility as the market portfolio, so $\sigma_i = \sigma_m$. What is the highest possible β of that investment?
   A) -1
   B) 0
   C) 0.5
   D) 1

8. Which of the following is impossible?
   A) Correlation (ρ) and beta (β) are both zero.
   B) Correlation is 0 and beta is 1.5.
   C) Correlation is 1 and beta is 1.5.
   D) Correlation is 1 and beta is 0.25.