Midterm exam #1

Investments (FIN 323), Fall 2025
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Please print your name on the line below:

_____ Answer key _____

- This test has 35 questions. You have 75 minutes to take the test.
- There are 20 multiple choice questions. These have only one answer.
  Mark your answer clearly in the box next to the question.
- There are 15 free-answer questions. **Their answer is always a number, a dollar amount, or a percentage return or growth rate.** Write your answer in the line under the question. I will only grade the answer, not the calculations that you did.
- You can bring one page of notes, front and back.
- You should bring a calculator, but it should not have wireless capability.

I. Asset classes

Questions 1 and 2 ask about buying and selling the same Treasury bill:

Question 1: Suppose you buy $1000 principal value of a 6-month Treasury bill, and the yield on that bill when you purchase it is 6%. What price do you pay? (Round to the nearest penny.)

<u>$971.29</u>

Question 2: Now suppose you sell that same bond three months later. At this date, the yield on the three-month Treasury bill is 3%. What return did you earn on the investment, as a percent? Round to two decimal places, for example 9.99%. (Reminder: You do not need to annualize this return.)

<u>2.20%</u>

Questions 3 through 6 ask about the same company:

Question 3: Suppose a company's share price is $40, and you forecast that *next* year's dividend per share will be $2. If you also calculate that the company's equity cost of capital is 8%, then what at what rate are the company's dividends forecasted to grow on average, according to the dividend discount model?

<u>3%</u>

Question 4: Suppose you decide that the dividend discount model is unreliable, and you would rather think about the prior company using the FCFE method. You forecast next year's FCFE as $1bn. If the company has 625m shares outstanding, then what is the growth rate of its FCFEs, according to this method?

<u>4%</u>

Question 5: If the market forecast of the FCFE growth rate rose to 6% instead of the answer that you gave to the prior question, what would the company's share price be?

<u>$80</u>

Question 6: Suppose the same company reports total assets of $2.5bn. What is its *book to market* ratio? State this as a decimal not a percent (for example 0.25 not 25%).

<u>0.1</u>

Question 7: In class we talked about Argentina's sovereign bonds issued in 2019, and we saw that their prices have risen greatly since they were issued. By comparison, bond prices have fallen significantly for most sovereign bonds over that time. What is the best explanation for Argentina's bond prices going up? (Even if you do not remember this discussion, you can answer just knowing concepts from class.)
- ☐ A) Risk-free rates around the world are much **higher** than in 2019.
- ☐ B) Risk-free rates around the world are much **lower** than in 2019.
- ☐ C) Argentina's default risk appears much **higher** than it did in 2019.
- ☐ D) <u>Argentina's default risk appears much **lower** than it did in 2019.</u>

Question 8: In what sense did we say that a long-term Treasury STRIP can be risky?
- ☐ A) You cannot be sure about the **amount** of the principal repayment.
- ☐ B) You cannot be sure about the **timing** of the principal repayment.
- ☐ C) <u>You cannot be sure about the **resale price** before the maturity date.</u>
- ☐ D) You cannot be sure about the **reinvestment rate** of coupons it pays.

Question 9: Suppose we sort companies into value and growth stocks based on their P/E ratios. What is about the growth stocks is expected to grow over time, from a DCF perspective?
- ☐ A) Their share prices.
- ☐ B) Their market capitalization.
- ☐ C) Their book value of equity.
- ☐ D) <u>Their earnings per share.</u>

Question 10: Which of the following ratios is not straightforward to connect with DCF valuation?
- ☐ A) <u>P/B (price to book)</u>
- ☐ B) P/D (price to dividends)
- ☐ C) P/E (price to earnings)
- ☐ D) P/FCF (price to free cash flow)

II. Stock returns, portfolios, and indexes

For questions 11 through 16, use the table below, which describes the share prices, share counts, and dividend payments of three stocks during a year. Note that the share count of the first stock decreases during the year. The others stay the same as where they started.

Symbol	Starting share count	Ending share count	Starting share price	Dividend per share, paid during the year	Ending share price
ABC	20m	10m	$10	$0	$13
QRS	10m	10m	$20	$0	$26
XYZ	20m	20m	$5	$0	$5

Question 11: What was the return on an **equal-weighted** portfolio of all three stocks during the year (as a percent)?

20%

Question 12: Suppose your initial portfolio size was $300. What would be your **dollar amount** of gross trading activity to rebalance the equal-weighted portfolio at the end of the year?

$40

Question 13: What was the return on a **value-weighted** portfolio of all three stocks during the year (as a percent)?

24%

Question 14: When you rebalance the value-weighted portfolio at the end of the year, what will this look like?
- ☐ A)   Buying more of ABC, no trade in the other stocks.
- ☐ B)   Selling some of ABC, no trade in the other stocks.
- ☐ C)   Buying more of ABC, selling the other two stocks.
- ☐ D)   Selling some of ABC, buying more of the other two stocks.

Question 15: Suppose a value-weighted index of all three stocks begins the year with a value of 10,000. What will the index be at the end of the year?

12,400

Question 16: In the previous question, what will the index divisor be after it is recalculated at the end of the year? Round to the nearest whole number.

39,516

Question 17: Suppose a company is scheduled to pay a dividend, but it cancels that dividend and uses that money to repurchase stock instead. This does not have any impact on investors' valuation of the company's future revenues, profits, or free cash flows. If we ignore tax effects, what effect will this have on the company's stock return, compared to the scenario where the company did pay the dividend?
- ☐ A)   Dividend yield **lower**, capital gain **higher**, total return **unchanged**.
- ☐ B)   Dividend yield **lower**, capital gain **unchanged**, total return **lower**.
- ☐ C)   Dividend yield **unchanged**, capital gain **higher**, total return **higher**.
- ☐ D)   Dividend yield, capital gain, and total return all **unchanged**.

Question 18: Which of the following is the main reason that the value-weighted portfolio of stocks is held by more investors than the equal-weighted portfolio?
- ☐ A)   Because it has performed better historically.
- ☐ B)   Because it allocates equal dollar amounts to all stocks.
- ☐ C)   Because its return is easier to calculate based on individual stock returns.
- ☐ D)   Because it is impossible for the average investor to hold anything else.

Question 19: Which of the following is *not* true about a value-weighted strategy?
- ☐ A)   Every investor could follow it.
- ☐ B)   It weights stocks according to their total available supply.
- ☐ C)   It forces you to buy stocks whenever their prices increase.
- ☐ D)   It requires regular rebalancing.

Question 20: Which is true of the "Agg" index, but *not* true of the S&P 500 index?
- ☐ A)   The index includes the return from reinvesting distributions.
- ☐ B)   The index tracks an equal-weighted portfolio.
- ☐ C)   The index measures the performance of the stock market.
- ☐ D)   The index formula is total market value scaled by a divisor.

III. Fund structures and performance measures

Questions 21 through 26 ask about the following situation. In all answers, ignore taxes.

Suppose you open a mutual fund. You issue 1000 shares of the fund to investors, who provide $10,000 in cash. You spend half of that amount on the first stock listed below, and the other half on the second stock, paying the prices listed for "start of year." There are no liabilities at the start of the year.

Stock symbol	Price per share, start of year	Dividend per share, during year	Price per share, end of year
NewCo	$20	$4	$25
OldCo	$10	$2	$10

Question 21: What is the fund's NAV per share at the start of the year?

$10

Question 22: At the end of the year, the fund makes the required distributions of income to its investors. After this, it has an unpaid liability of $250 for its costs of operation during the year. What is the fund's NAV at this point?

$11.00

Question 23: What return did its investors experience, as a percent?

30%

Question 24: At the end of the year and after the above calculations, suppose an investor redeems 200 shares back to the fund. The fund raises the cash to cover this redemption by selling shares of OldCo. By what dollar amount will the fund's NAV per share decrease, after any required distribution of capital gain to its investors? Assume all distributions are in the form of more shares in the fund.

$0

Question 25: Now suppose that the fund raises cash to cover the redemption of 200 shares by selling shares of NewCo instead of OldCo. In this case, by what dollar amount will the fund's NAV per share decrease, after any required distribution of capital gain to its investors? Again, assume all distributions are in the form of more share in the fund.

$0.55

Question 26: In Question 25, what would change if the fund was an ETF instead of a mutual fund (and the redeeming investor was an authorized participant)?
- ☐ A) Nothing would change.
- ☐ B) The fund would realize a capital gain, but would not need to distribute it.
- ☐ C) The fund would distribute a capital gain, but only to the redeeming investor.
- ☐ D) <u>The fund would not realize or distribute a capital gain</u>

Question 27: Suppose an ETF has 5m shares outstanding, its portfolio consists of 10m shares of MSFT, and it has no other assets or liabilities. Suppose MSFT shares trade for $500, and ETF shares trade for $501. An authorized participant (AP) delivers 10,000 shares of MSFT to the fund. What will the AP receive from the fund?
- ☐ A) $5.01 million in cash.
- ☐ B) $5 million in cash.
- ☐ C) <u>10,000 ETF shares worth $5.01 million.</u>
- ☐ D) <u>5,000 ETF shares worth $5.01 million.</u>

(C and D were both accepted based on the concept that the AP will receive ETF shares rather than cash. Neither is exactly correct due to a typo in the setup of the question.)

Question 28: Which of the following is a problem with other fund types that is *also* a problem for ETFs?
- ☐ A) Tracking error between fund price and value of holdings.
- ☐ B) <u>Unwanted tax events due to distribution of dividend income.</u>
- ☐ C) Need for large cash holdings that affect performance.
- ☐ D) Need to calculate a share price to clear orders to buy or sell fund shares.

Question 29: All funds make regular distributions to investors of any income they have realized on their investments, such as the capital gains from selling securities. Why?
- ☐ A) To reduce tracking error with their indexes.
- ☐ B) To avoid forcing tax events into their investors.
- ☐ C) To meet investor demand for high rates of cash payout.
- ☐ D) <u>To qualify for exemption from corporate income tax.</u>

Question 30: Suppose we are comparing two active equity mutual funds, AAAX and BBBX. We calculate their cumulative returns over a range of time based on NAV and distributions, as in our examples from class. We find that the cumulative return for AAAX was higher than BBBX. Which of the following can we definitely conclude?
- ☐ A) AAAX selected a better-performing portfolio than BBBX.
- ☐ B) AAAX charged lower fees than BBBX.
- ☐ C) <u>AAAZ was a better investment than BBBX in hindsight.</u>
- ☐ D) AAAX refused new money from investors while BBBX did not.

IV. Evidence on investment performance

Question 31: We saw that, among active equity mutual funds, the average fund reliably underperforms a stock market index. Why is this unsurprising?
- [ ] A) Mutual funds collectively look like **the market portfolio.**
- [ ] B) Mutual funds collectively look like an **equal-weighted portfolio**.
- [ ] C) Mutual fund managers do not know what they are doing.
- [ ] D) Mutual funds are a scam that should be avoided.

Question 32: The RenTech Medallion fund outperformed the market by a large amount, many years in a row. Below are some facts about this fund (all are true). Which is the *best* explanation why it can deliver *persistent* performance, when mutual funds cannot?
- [ ] A) The fund has a very long-term focus.
- [ ] B) The fund employs mainly scientists, not finance professionals.
- [ ] C) The fund has been closed to new investors since 1993.
- [ ] D) The fund's returns exhibit a very large degree of volatility.

Question 33: The "sympathetic view" of mutual fund performance and persistence suggests that the true measure of a fund manager's skill is the size of their fund. Why?
- [ ] A) Because the manager's skill is in marketing, not investing.
- [ ] B) Because a larger fund can charge a higher percentage of assets as fees.
- [ ] C) Because a larger fund shows that it took more money to drive the manager's return down to an average number.
- [ ] D) Because a larger fund can invest in more exotic asset classes.

Question 34: Suppose you want to know the return on the stock market over the last year. You look up all the companies that are publicly listed today, get all their stock returns including dividends over the past year, and calculate a value-weighted average. Why is this going to *overstate* the true return of the stock market over the past year?
- [ ] A) It is more appropriate to use an equal-weighted average.
- [ ] B) Average returns are misleading about the performance of the typical stock.
- [ ] C) Dividends should not be included in the returns that you calculate.
- [ ] D) You are missing the companies that were delisted from the stock market.

Question 35: What kind of evidence did we see regarding the (past) returns on simple strategies like size investing, value investing, and momentum investing?
- [ ] A) They offered no opportunity to improve returns compared to an index.
- [ ] B) They all resulted in lower returns compared to an index.
- [ ] C) Only size and value investing offered opportunities for higher returns.
- [ ] D) All three offered simple ways to earn higher average returns.