

Midterm exam #1
Investments (FIN 423), Fall 2022
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Please print your name on the line below:

- This test has 25 questions. Each question counts for one point .
- You have 75 minutes to take the test. (3 minutes per question.)
- 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 **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. Stock returns, portfolios, and indexes

For the questions in this section, use the table below, which describes the prices and dividends of two stocks during a year. Note that their share counts do not change during the year. (Just for questions 7 and 8, you will change this assumption.)

| Symbol | Shares outstanding, start <i>and</i> end of year | Price per share, start of year | Dividend per share, during year | Price per share, end of year |
|--------|--|--------------------------------|---------------------------------|------------------------------|
| ABC | 10m | \$10 | \$4 | \$10 |
| XYZ | 20m | \$15 | \$3 | \$21 |

Question 1: What was the capital gain of stock ABC?

0%

Question 2: What was the dividend yield of stock XYZ?

20%

Question 3: What was the return on an **equal-weighted portfolio** of the two stocks?

50%

Question 4: If you rebalance this equal-weighted portfolio at the end of the year, what type of activity will this involve, aside from just reinvesting dividends?

(Hint: Just compare the capital gains on the stocks.)

- ☐ A) Shifting the portfolio allocation away from ABC, towards XYZ.
- ☒ B) **Shifting the portfolio allocation away from XYZ, towards ABC.**
- ☐ C) Decreasing the overall invested amount by selling some of each stock.
- ☐ D) No rebalancing will be required.

Question 5: What was the return on a **value-weighted portfolio** of the two stocks?

55%

Question 6: What is the return on a **value-weighted index** of the two stocks? Assume this index is constructed like the examples we have done in class and in your homework. (Hint: You **do not** need to calculate a divisor change for this question.)

30%

Question 7: Now suppose that we change the **end-of-year share count** for XYZ to **33m** instead of 20m, but everything else in the table stays the same. By what percent will the divisor of the value-weighted index need to increase, in response to this change?

- ☐ A) 50.0%
- ☒ B) 52.5%
- ☐ C) 55.0%
- ☐ D) 57.5%

Question 8: As in the previous question, suppose that the end-of-year share count for XYZ is 33m instead of 20m. Now what kind of rebalancing would be required for a value-weighted portfolio, aside from just reinvesting dividends?

- ☒ A) Shifting the portfolio allocation away from ABC, towards XYZ.
- ☐ B) Shifting the portfolio allocation away from XYZ, towards ABC.
- ☐ C) Decreasing the overall invested amount by selling some of each stock.
- ☐ D) No rebalancing will be required.

II. Funds

Here again is the data from the previous section. Use it for the next three questions.

| Symbol | Shares outstanding, start <i>and</i> end of year | Price per share, start of year | Dividend per share, during year | Price per share, end of year |
|--------|--|--------------------------------|---------------------------------|------------------------------|
| ABC | 10m | \$10 | \$4 | \$10 |
| XYZ | 20m | \$15 | \$3 | \$21 |

Suppose that at the start of the year, you set up a **closed-end fund** with 100 shares outstanding. Its investment portfolio is 10 shares of ABC, and 10 shares of XYZ. It starts with no liabilities. During the year, the fund receives \$70 of dividends from its portfolio, and pays this out as a distribution. At the end of the year, the fund still holds the same investment portfolio it started with. Assume that it also has accrued liabilities of \$50.

Question 9: What is the fund's NAV at the start of the year?

\$2.50

Question 10: What is the fund's NAV at the end of the year?

\$2.60

Question 11: Suppose the share price of your closed-end fund begins the year *and* ends the year at \$3.50. What is the percent return to investing in the fund during the year?

20%

Question 12: Which fund type must pay the most attention to its cash balances?

- ☒ A) Open end fund (mutual fund)
- ☐ B) Closed-end fund
- ☐ C) Exchange-traded fund (ETF)
- ☐ D) Unit investment trust

Question 13: Which of these is a difference between an ETF and a closed-end fund?

- ☐ A) ETF shares are exchange-traded, while CEF shares are not.
- ☒ B) ETFs frequently see changes in their number of shares outstanding, while CEFs do not.
- ☐ C) ETFs allow all investors to obtain or redeem shares, while CEFs do not.
- ☐ D) ETF shares always sell for exactly their NAV, while CEF shares do not.

Question 14: Suppose an ETF has a balance sheet that consists only of 1000 shares of AAPL (Apple), and 1000 shares outstanding. The market price of AAPL is \$150. Suppose an authorized participant (AP) wants to create 1 new share of the ETF. What must it provide to the fund in exchange for this new share?

- ☐ A) \$150 in cash
- ☐ B) \$1000 in cash
- ☒ C) 1 share of AAPL
- ☐ D) 1.5 shares of AAPL

Question 15: Suppose the share price of the ETF falls far below its NAV, presenting an arbitrage opportunity for an authorized participant (AP). Which of the following things would be part of the AP's strategy to profit from this difference?

- ☐ A) Sell shares of the ETF on the exchange where they trade.
- ☒ B) Buy shares of the ETF on the exchange where they trade.
- ☐ C) Deliver AAPL shares to the ETF, in exchange for new ETF shares.
- ☐ D) Deliver cash to the ETF, in exchange for new ETF shares.

Question 16: 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) To qualify for exemption from corporate income tax.

III. Valuation, security analysis, value investing

Question 17: A *small-cap value* strategy tries to invest in value stocks with a small market capitalization. Which of these stocks would be *most* attractive to this strategy?

| | Company | Share price | Shares outstanding | Book value of equity |
|--|---------|-------------|--------------------|----------------------|
| <input type="checkbox"/> A) | A | \$1.00 | 10 billion | \$1 billion |
| <input checked="" type="checkbox"/> B) | B | \$2.00 | 5 billion | \$2 billion |
| <input type="checkbox"/> C) | C | \$4.00 | 5 billion | \$2 billion |
| <input type="checkbox"/> D) | D | \$5.00 | 4 billion | \$4 billion |

Question 18: Suppose a stock has a price-dividend ratio of 12.5. You forecast that the future annual dividend growth rate is 4% ($g = 4\%$). What must be the company's equity cost of capital (r_E), in order for the company's stock price to make sense according to the dividend-discount model?

12%

Question 19: Suppose a company has 1 billion shares outstanding. You expect it to generate \$1 billion in free cash flow to equity (FCFE) next year, and, you forecast that the company's FCFEs will then grow at an average rate of 2% forever after. Finally, you calculate that the company's equity cost of capital r_E is 6%. What is the company's intrinsic share price, according to the FCFE valuation approach?

\$25

Question 20: Which of these should *not* cause a stock's intrinsic value to rise?

- ☒ A) Higher discount rate for its dividends.
- ☐ B) Lower discount rate for its dividends.
- ☐ C) Higher dividends in the upcoming year.
- ☐ D) Higher growth rate of dividends in the future.

IV. Mutual fund performance and passive investing

Question 21: In class we discussed a 1995 paper by Burton Malkiel. One of his important contributions was to correct for *survivorship bias*. How did he do this?

- ☒ A) Collected data on funds that had closed.
- ☐ B) Collected data on funds' expense ratios.
- ☐ C) Separated funds by investment category.
- ☐ D) Compared funds' returns with the S&P 500 index return.

Question 22: Malkiel was able to measure the performance of mutual funds in his sample *before* subtracting out expenses. This is something we were not able to do with our in-class examples. What did he need to do, in order to perform this analysis?

- ☐ A) Collected data on funds that had closed.
- ☒ B) Collected data on funds' expense ratios.
- ☐ C) Separated funds by investment category.
- ☐ D) Compared funds' returns with the S&P 500 index return.

Question 23: Many mutual fund investors engage in *performance-chasing* behavior. That is, they always invest in the funds that have the best recent performance. Based on the evidence we saw in class, what would you expect about the returns to this behavior in the modern world, compared to simply investing in a passive index fund?

- ☐ A) Performance-chasing would generate **higher and riskier** returns.
- ☐ B) Performance-chasing would generate **higher and safer** returns.
- ☒ C) Performance-chasing would generate **similar returns** to a passive strategy, or perhaps a bit less.
- ☐ D) Performance chasing would return **approximately the risk-free rate**.

Question 24: We discussed two possible interpretations of the evidence on mutual fund performance. One was that active fund managers do not have any investment skill. The other interpretation was more positive. What was a key idea in this second interpretation?

- ☐ A) Investors do not "chase performance."
- ☐ B) Investors are irrational.
- ☐ C) All funds have the same size.
- ☒ D) Managers cannot scale up their skill with the size of their fund.

Question 25: Which of the following is *not* true about a value-weighted strategy?

- ☐ A) Every investor could follow it.
- ☒ B) It forces you to buy stocks whenever their prices increase.
- ☐ C) It weights stocks according to their total available supply.
- ☐ D) It requires regular rebalancing.