

Midterm (75 minutes)

You don't need to do tedious calculations; if calculations are needed, you must write the explicit equation(s), identifying the variables. Do not write "Y = aX; solve for X." You can write "100 = 10X; solve for X."

1. For each of the following pairs, identify the asset with the longer duration:
 - a. a conventional 30-year amortized mortgage at 8% or a 15-year zero with an 8% yield to maturity.
 - b. a 5-year zero with a 5% yield to maturity or a 10-year zero with a 10% yield to maturity.
 - c. a 10-year 7%-coupon bond with a 5% yield to maturity or a 10-year zero with a 6% yield to maturity.
2. Explain why you either agree or disagree with this definition of Tobin's q from investopedia.com:

A ratio devised by James Tobin of Yale University, Nobel Laureate in Economics, who hypothesized that the combined market value of all the companies on the stock market should be about equal to their replacement costs....For example, a low Q (between 0 and 1) means that the cost to replace a firm's assets is greater than the value of its stock, which implies that the stock is undervalued. Conversely, a high Q (greater than 1) implies that a firm's stock is relatively more expensive than the replacement cost of its assets, which implies that the stock is overvalued.
3. The "Beardstown Ladies" (an investment club of grandmothers in Beardstown, Illinois) wrote 5 best-selling investment guides after reporting that their investment club had made 23.4% a year from 1984 through 1993, while the Dow Jones Industrial Average would have returned only 15.7% a year. However, it turned out that their 23.4% return was only for two years, 1991-1992 and that they had simply compared the value of their portfolio at the beginning and end of the period, without taking into account the annual dues that were added to the portfolio. Once these were taken into account, their annual return from 1984 through 1993 dropped to 9.1%. How would you calculate the annual return for an investment club's portfolio that had regular dues added to the portfolio? You must give an explicit equation and define all variables.

4. The annual interest rate on a 20-year zero is 5% and the annual interest rate on a 5-year zero is 4%.
- What is the implicit annual interest rate on a 15-year zero 5 years from now that is embedded in this term structure? (Just set up.)
 - If you expect the annual interest rate on a 15-year zero 5 years from now to be 4%, what will your expected annual rate of return be if you buy the 20-year zero now and sell it after 5 years? (Just set up.)
 - Explain why you believe that the rate of return you calculate in Part (b) will be either higher than, lower than, or equal to 4%.
5. The Get Rich Investment Guide published by Consumers Digest discusses the fact that an investor who buys a stock ex-dividend doesn't receive the latest dividend: "Obviously, one strategy is to know when the stock will go ex-dividend and buy a day or two before the cutoff. Then you can receive the dividends, and you can sell the shares as soon as you have [received the dividend]." What is the flaw in this strategy?
6. Explain why this advice is logical, but not very helpful: "It is obviously good sense to buy bonds when the Federal Reserve Banks start lowering interest rates. It is just as obviously bad sense to buy them at any time when, two or three or four months hence, the Fed is certain to start raising money rates and lowering the prices of outstanding bonds."

7. “You have just decided to buy a house and need to borrow \$100,000. One bank offers you a mortgage loan to be repaid over 30 years in 360 monthly payments. If the interest rate is 12% per year, what is the amount of the monthly payment?...Another bank offers you a 15-year mortgage loan with a monthly payment of \$1,100. Which is the better deal?” Zvi Body & Robert Merton (Finance, 2001, p. 121) note that the monthly payment of the 30-year mortgage is \$1028.61, which is less than the \$1,100 monthly payment on the 15-year mortgage. But because the APR on the 15-year mortgage is 10.4%, they conclude that the 15-year mortgage is the better deal. Is it always true that the loan with the lower APR is the better deal?
8. The Wall Street Journal recently reported that some investors were beginning to think that the Fed might reduce interest rates soon, and that, “Lower interest rates are considered good for stocks because they reduce the cost of corporate debt, thus helping profits, and encourage consumer spending.” Explain why you either agree or disagree that a company’s stock price should not be affected by interest rates if it has no debt and is little affected by changes in consumer spending.
9. In March 2000, Wharton professor Jeremy Siegel wrote a Wall Street Journal article arguing that the price-earnings ratios for large tech stocks were probably not justified. For example, JDS Uniphase had a 1999 P/E of 668.3, paid no dividends, and had a total market value of \$99 billion. Analysts’ seemingly optimistic prediction was that its earnings would grow at 44% a year for the next 5 years. Siegel calculated that if its earnings grew at 44% a year for 10 years and “investors expect to receive an average 15% annual return,” its P/E ratio in 10 years would be 68.3. Henry Goldstein, professor emeritus of economics at the University of Oregon, responded by arguing that “the latest Barron’s gives a consensus earnings forecast of \$1.09 a share for JDSU for 2001. If such earnings were to rise by 44% annually over the following 9 years, the company’s earnings in 2010 would be \$29.02 per share. With the stock’s price constant at its recent ... level of \$266 per share, its P/E in 2010 would then be a mere 9.2. So: Is this stock ‘a buy’ or ‘a steal’?”
- Do not check their calculations. Instead identify the logical error that explains their quite different conclusions. In your opinion, which economist’s approach makes more sense?

10. Here are some data (millions of dollars) for a hypothetical company:

	Assets		Liabilities
plant and equipment	100	debt	0
		book value of equity	100
Total	100	Total	100
total revenue		25	
operating expenses		10	
taxes		5	
net after-tax income		10	
dividends		4	
retained earnings		6	
rate of return on assets		10%	
shareholder's required return		8%	

Assume that the firm's dividends, earnings, and assets are all growing at the same constant rate. Estimate the fundamental value of this company using

a. the dividend-discount model. (Just set up.)

b. the economic-value-added model. (Just set up.)

c. Explain why you expect the answer to (b) to be higher than, lower than, or the same as the answer to (a).