

Midterm Answers

1. a. The Dow is a market value index and is not measured in dollars. When the index rises 3 points this does not mean that the price or average price of anything increased by three dollars. [The Wall Street Journal, Centennial Edition, 1989.]  
b. The Dow is an average of the prices of thirty blue chips. [The accompanying story reported that the percentage drop in the S&P 500 that day was twice as large as the drop in the Dow. Thus the Dow dropped, even though the blue chips in the Dow did somewhat better (that is, fell less) than the broader market averages, and the headline writer misstated this event. [Cape Cod Times, July 21, 1989.]  
c. [Tom Petrino, Los Angeles Times, November 7, 1990.] Treasury bills are short-term bonds that mature in less than one year. Investors who buy Treasury bills are implicitly betting on an increase in interest rates so that they can roll over their investment at higher interest rates. (The article told how there had been aggressive buying the previous day at the U.S. Treasury's auction of 3-to-5 year Treasury notes, suggesting that, while the term structure was upward sloping at the time, with 1-year Treasury bonds paying 7.4%, 4-year Treasury bonds paying 7.8%, and 10-year Treasury bonds yielding 8.60%, these buyers expected interest rates to decline over the next three-to-five years. The headline writer mistakenly called these note buyers "T-bill investors.")
2. Smith wrote, "Yep, but we value investors have our eye on 2031 and beyond."
3. a. The municipal-bond interest rate, at least for states with no income tax, would probably be about 75% of the corporate-bond interest rate; for example, if corporate bonds yielded 4%, municipal bonds would be priced to yield about  $(1-.25)4\% = 3\%$ . Municipals issued within states with income taxes would yield somewhat less.  
b. They would probably be priced to yield approximately the same rate of return.
4. Stocks are disguised bonds: Treasury bonds playing 1.8% with fixed coupons or stocks with 1.7% dividends that are very likely to grow by several percent a year. I'd rather have stocks over the next 10 years.
5. The relevant question is whether you want to borrow more at (a tax-deductible) 2.75%, perhaps because you can make a better return invested in stocks. [DougWhiteman, Suze Orman: Avoid this 'huge mistake' when refinancing to low mortgage rates, Yahoo Finance, September 20, 2021.]
6. Warren Buffett evidently feels that the rate of return from Berkshire's investments is larger than its shareholders' required rate of return. [Cummins, Jared, Does Berkshire Hathaway Pay Dividends?, dividend.com]

7. The real return  $r$  is

$$1+r = \frac{1+R}{1+\pi}$$

where  $R$  is the nominal return and  $\pi$  is the rate of inflation over the life of the bond.

Here, the real return is 0.1288%:

$$1+r = \frac{1+R}{1+\pi} = \frac{1.0153}{261.58/257.97} = \frac{1.0153}{1+(261.58-257.97)/257.97} = 1.001288$$

8. The payment of annual dues will be most attractive for high required returns, since these lessen the burden of making future payments. The break-even required return is where the present value of the annual dues is just equal to \$120. In calculating the present value of the annual dues, we recognize that the first payment is immediate:

$$\$120 = \$10 + \frac{\$10(1.05)^1}{(1+R)^1} + \frac{\$10(1.05)^2}{(1+R)^2} + \dots + \frac{\$10(1.05)^{19}}{(1+R)^{19}}$$

Then solve for  $R$ .

The details are:

$$\begin{aligned} \$110 &= \frac{\$10(1.05)}{1+R} \left( 1 + \left( \frac{1.05}{1+R} \right)^1 + \dots + \left( \frac{1.05}{1+R} \right)^{18} \right) \\ &= \frac{\$10(1.05)}{1+R} \left( \frac{1 - \left( \frac{1.05}{1+R} \right)^{19}}{1 - \left( \frac{1.05}{1+R} \right)} \right) \\ &= \frac{\$10(1.05)}{R - 0.05} \left( 1 - \left( \frac{1.05}{1+R} \right)^{19} \right) \end{aligned}$$

The break-even value is  $R = 0.114$  (11.4%)

9. answer:

$$V = \frac{\$1}{1+0.10} + \frac{\$1(1+0.15)^1}{(1+0.10)^2} + \frac{\$1(1+0.15)^2}{(1+0.10)^3} + \dots + \frac{\$1(1+0.15)^{10}}{(1+0.10)^{11}} + \frac{\$1(1+0.15)^{10}(1+0.05)^1}{(1+0.10)^{12}} + \frac{\$1(1+0.15)^{10}(1+0.05)^2}{(1+0.10)^{13}} + \dots$$

10. a. unchanged  
 b. up  
 c. up  
 d. down  
 e. up