

Midterm (75 minutes)

No calculators allowed; if calculations are needed, write the explicit equation(s), identifying the variables. Do not write “ $Y = aX$; solve for X .” You can write “ $100 = 10X$; solve for X .” BE SURE TO EXPLAIN YOUR REASONING. If you want extra time, you can buy time at a price of 1 point a minute; for example, if your test is handed in 10 minutes after the scheduled finish time, 10 points will be subtracted from your test score.

1. In the *Sopranos* television show, Tony Soprano turned down an offer of \$225 a square foot for some property he owned, explaining that, “As a businessman, I gotta tell you that in ten years’ time that property’s gonna be worth twice as much as they’re offering.” If the realtor had been familiar with the Rule of 72, she could have calmly replied, “That’s about X percent a year; not bad, but not as good as an average year in the stock market.” What is the value of X ?

2. What is your reaction to this dialogue from the *Sopranos* television show:
Financial adviser: *T-bills, I was able to lock you in before the rates dropped.*
Tony: *What doesn’t this kid know about money? You know, I trust him 1,000 percent. Thank you.*

3. *Consumer Reports* gave the following advice about auto loans:
The nice thing about auto loans is that you can locate the lemons before you sign on the dotted line. Just keep your eye on the APR—the Annual Percentage Rate.... Obviously, the lower the APR, the better. Another point to keep in mind: the shorter the loan the better....a one-year loan is much cheaper than a four-year loan. Say you borrow \$4000 at 11%. For a one-year loan, the total interest would be \$242. The total interest for a four-year loan would be \$963—about four times as much. Of course, the monthly payments for the longer loan would be smaller, but remember that you pay heavily for that convenience.
 - a. Why is the \$242 total interest on a 1-year loan far less than 11 percent of \$4000?

 - b. Why is the total interest on a 4-year loan more than on a 1-year loan?

 - c. What is the present value of each stream of monthly payments, discounted at a 11 percent required return?

 - d. Assuming the same interest rate on each loan, are there any circumstances in which “the shorter the loan, the better” is not true?

4. For each of the following pairs, identify the asset with the longer duration:
- a conventional 30-year amortized mortgage at 8% or a 15-year zero with an 8% yield to maturity.
 - a conventional 30-year amortized \$400,000 mortgage at 6% or a conventional 30-year amortized \$800,000 mortgage at 6%.
 - a 5-year zero with a 10% yield to maturity or a 10-year zero with a 5% yield to maturity.
 - a 10-year 7%-coupon bond with a 5% yield to maturity or a 10-year zero with a 6% yield to maturity.
5. A *Business Week* article on recent dividend increases argued that “the outlook is good for continued increases. The average [dividend] yield is just 2.9%, low by historical standards. With interest rates rising, dividend yields may have to rise, too, to stay competitive.” Explain how dividend yields can rise, even if dividends do not.
6. A senior manager at Morgan Stanley wrote that,
To find the present value of the future earnings of a company in perpetuity, financial theorists use the model,
- $$P = E/(r - g)$$
- where P = Price, E = Earnings, r = the discount rate of the asset, and g = the growth rate of the earnings.
Explain his mistake.
7. This Morgan Stanley senior manager went on to argue that he uses $r = 0.10$ because “as an investor, I always have the choice of simply investing in an index fund” and these have returned 10% “throughout the modern period.” Explain why you either agree or disagree.

8. Explain this observation regarding life insurance companies and pension funds:
Contemporary accounting practice tends to promote the view that increases in bond prices are a positive outcome even when the long-run impact of the associated decline in interest rates is negative.
9. In 2013 Marc Basto, InvestorPlace Assistant Editor, wrote that,
If you plan to buy and hold Walt Disney (NYSE:DIS) stock in perpetuity, why not glom on to Disney's 7.55% Coupon 2093 Maturity long-term note? The price of this offer is now well above par (the \$100 mark), but its 3.56% yield to maturity is a nice return, fully 2 percentage points better than Disney's current dividend yield.
Why might a Warren Buffett disciple buy Disney stock instead of Disney bonds?
10. An investments text states that, "Book and market values will probably be equal when the stock is issued, but after that, it appears that only coincidence will keep them equal at any given moment." If a firm's book value is approximately equal to the replacement cost of its assets, can you think of any logical, noncoincidental reason why market value should be above, below, or equal to book value?