Summary 2016: Midterm B Name Key

Note: Problem 5 is on the second page.

Short Answer (15 points each)

1. Kellogg stock has a bid price of $82.53 and an ask price of $82.61. If you submit a market order to sell 500 shares of Kellogg, how much will you receive from the sale?

+1 +14
500x82.53

2. What is <u>one</u> disadvantage of organizing a business as a partnership?

+15 one of: unlimited liability for (general) partners, partnership ends w/ death or withdrawal of partner

3. Assume you have short-sold Amazon stock (which pays no dividends). What will lead to a loss on your short-sale?

+15 price rises

4. You are planning to invest $614 into an account so that you can withdraw $100 a year for 10 years beginning a year from today. Just before you deposit the $614, the interest rate on the account changes and you discover that you only need to deposit $575 in the account. Which direction have interest rates changed?

+15 risen

5. You own a 5% coupon bond that matures 10 years from today and a zero-coupon bond that matures 30 years from today. If the yield to maturity on both bonds rises by 2%, which bond will change in price the most?

+15 zero-coupon 30-year

Problems (75 points each)

Note: Unless I specifically state "calculations required", you can just set up all problems and tell me what you are solving for in each step. If you are using the result of an unsolved equation in a later step, just make that clear. One way to do this, set up the equation and call your result "A" or "B", etc. If you prefer, you can solve everything.

1. Assume you are thinking about buying bonds issued by Wal-Mart and want to determine whether Wal-Mart's ability to make interest payments is improving or deteriorating. Using the attached income statement, calculate Wal-Mart's Interest Coverage Ratios to determine whether it is more capable of making its interest payments in 2016 than in 2015. Note: calculations required.

2016

$$ICR = \frac{EBIT}{IE} = \frac{24{,}105}{2467} = 9.771$$

+11/+3

+6 +6

$$ICR = \frac{EBITDA}{IE} = \frac{24{,}105 + 9454}{2467} = 13.6032$$

+6

2015

$$ICR = \frac{EBIT}{IE} = \frac{27{,}147}{2348} = 11.5618$$

+11/+3

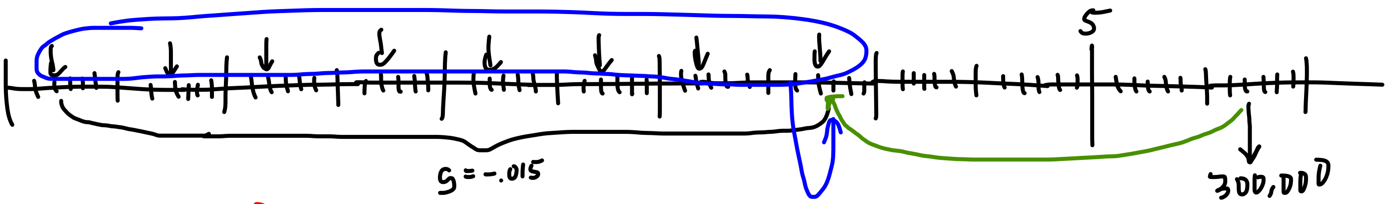
+6 +6

$$ICR = \frac{EBITDA}{IE} = \frac{27{,}147 + 9173}{2348} = 15.4685$$

+6

+11 $\Rightarrow$ less able to make interest payments, but still well above 1.0

2. You would like to accumulate $300,000 by five years and eight months from today. Two months from today, you plan to make the first of a series of semiannual deposits into an account that pay an APR of 6.5% with monthly compounding. Each deposit will be 1.5% smaller than the previous one and your final deposit will occur three years and eight months from today. Set up the calculations needed to determine how large your final deposit needs to be for you to achieve your goal?



+5 $V_{3y8m} = \frac{300,000^{+2}}{\left(1+r\left(\frac{1}{12}\right)\right)^{24}}$ +6 (-5) (13) 4 if $r\left(\frac{1}{2}\right)$

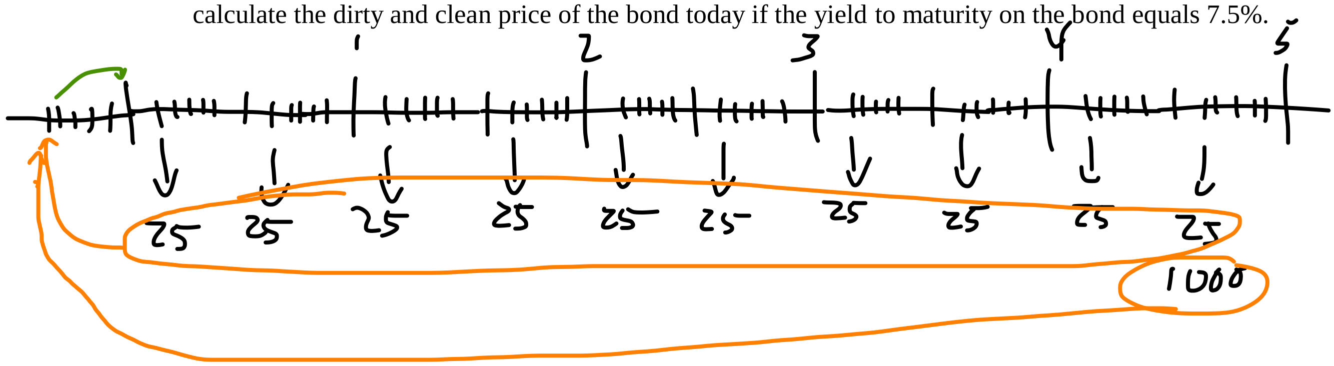
+5 $V_{3y8m} = \left(\frac{C_{2m}^{+6}}{r\left(\frac{1}{2}\right) - (-.015)}\right)\left(\left(1+r\left(\frac{1}{2}\right)\right)^{8} - (1-.015)^{8}\right)$ +6 (-5) +2 $\Rightarrow$ solve for +2 C_{2m} (21)

+5 $r\left(\frac{1}{12}\right) = \frac{.065}{12}$ +2 +6 (13)

+5 $r\left(\frac{1}{2}\right) = \left(1+r\left(\frac{1}{12}\right)\right)^{6} - 1$ +6 (-5) (11)

+5 $C_{3y8m} = C_{2m}(1-.015)^{7}$ +6 +6 (17)

3. A bond issued by Southwest Aero matures 4 years and ~~8~~ 7 months from today for $1000. The bond pays an annual coupon rate of 5%, but coupons are paid semiannually. Set up the calculations needed to calculate the dirty and clean price of the bond today if the yield to maturity on the bond equals 7.5%.



+5 $y = \frac{.075}{2}$ +2 +8 15

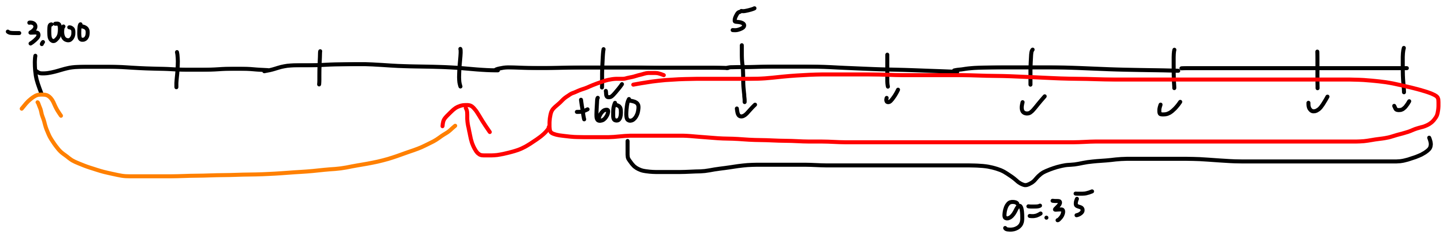
+5 +5

$V_{-5m} = \left(\frac{25}{y}\right)\left(1-\left(\frac{1}{1+y}\right)^{10}\right) + \frac{1000}{(1+y)^{10}}$ 16 +3 +8 +2 +8 15

+5 $V_0 = V_{-5m}(1+y)^{5/6}$ = dirty price +8 13

+5 Clean = $V_0 - 25\left(\frac{5}{6}\right)$ +3 +8 16

4. HoHum Portal is considering whether to acquire startup firm, Wow Apps, for $3 billion. HoHum does not expect Wow to generate any cash flows until four years from today when it generates a net cash inflow of $600 million. Net cash flows would then grow by 35% per year through 10 years from today. Wow would then shut down. HoHum estimates that the cost of capital for Wow equals 20%. Set up the calculations needed to determine the net present value of the investment by HoHum in Wow.



37 +12 27

+5 +6 +5 +12

$$NPV = -3000 + \underbrace{\left(\frac{600}{.2-.35}\right)\left(1-\left(\frac{1.35}{1.2}\right)^{7}\right)}_{+10}\underbrace{\left(\frac{1}{1.2}\right)^{3}}_{+10}$$

+5 +5 +5

5. Each share of Gains ETF trades for \$460. For each outstanding share of Gains ETF, it has purchased ten shares of Agra Corp, it has short-sold two share of Petro Corp, it has purchased Treasury securities that mature one year from today for \$100 and it has short-sold Treasury securities that mature two years from today for \$100. Given the prices and payments given below, set up a table that shows your maximum arbitrage profit (per share). In the table, list the transactions required today and the cash flows today, one year from today, and two years from today from all transactions. Also show that the total cash flows one year from today and two years from today equal zero regardless of whether the economy is weak or strong. Add notes here

		Payoff in one year		Payoff in two years	
Security	Price	Strong	Weak	Strong	Weak
Agra Corp	50	10	5	100	25
Petro Corp	30	5	0	50	20
1-Year Treasury	98	100	100	0	0
2-Year Treasury	95	0	0	100	100

No arbitrage price $= 10 \times 50 - 2 \times 30 + 98 - 95 = 443$

$\Rightarrow$ short sell ETF

Payoffs on ETF:

$S1 = 10 \times 10 - 2 \times 5 + 100 = 190$

$W1 = 10 \times 5 + 100 = 150$

$S2 = 10 \times 100 - 2 \times 50 - 100 = 800$

$W2 = 10 \times 25 - 2 \times 20 - 100 = 110$

		CF1		CF2	
Transaction	CF0	S	W	S	W
+5 Short ETF	+460 +2	−190 +2	−150 +2	−800 +2	−110 +2
+5 Buy 10 Agra	−10×50 +2	+10×10 +2	+10×5 +2	+10×100 +2	+10×25 +2
+5 Short 2 Petro	+2×30 +2	−2×5 +2	∅ +2	−2×50 +2	−2×20 +2
+5 Buy 1yr T	−98 +2	+100 +2	+100 +2	∅ +1	∅ +1
+5 Short 2yr T	+95 +2	∅ +1	∅ +1	−100 +2	−100 +2
Total	+17 +4	∅	∅	∅	∅