ECON 133 – Securities Markets – FALL 2010, UCSC

Practice Questions for the Final Exam – Answer Key

Multiple Choice

1. The market portfolio has a beta of ____D_____.
   A. -1.0
   B. 0
   C. 0.5
   D. 1.0
2. Consider the CAPM. The risk-free rate is 5% and the expected return on the market is 15%. What is the beta on a stock with an expected return of 17%? D
   A. .5
   B. .7
   C. 1
   D. 1.2
3. A coupon bond which pays interest semi-annually has a par value of $1,000, matures in 10 years, and has a yield to maturity of 8%. If the coupon rate is 7%, the intrinsic value of the bond today will be ____A_____ (to the nearest dollar).
   a. $932
   b. $1,000
   c. $1,081
   d. $1,100
4. A zero-coupon bond has a yield to maturity of 6% and a par value of $1,000. If the bond matures in 8 years, it should sell for a price of _____C____ today.
   a. $507.00
   b. $617.00
   c. $627.00
   d. $757.00
5. If the coupon rate on a bond is 4.50% and the bond is selling at a premium, which of the following is the most likely yield to maturity on the bond? A
   A. 4.30%
   B. 4.50%
   C. 5.20%
   D. 5.50%

6. A common stock pays an annual dividend per share of $2. The market capitalization rate is 5%. If the annual dividend is expected to remain at $2, the value of the stock is___B__.

A. 25
B. 40
C. 75
D. 100

7. The market capitalization rate for Admiral Motors Company is 8%. Its expected ROE is 10% . If the firm's plowback ratios is 40%, what will be its P/E ratio? ___C__
   A. 10
   B. 12
   C. 15
   D. 18
8. Mintmark Corporation will pay a year-end dividend of $4, and dividends thereafter are expected to grow at the constant rate of 4% per year. The risk-free rate is 4%, and the expected return on the market portfolio is 9%. The stock has a beta of 0. 8. The intrinsic value of stock is ___B___.
   A. 50
   B. 100
   C. 150
   D. 180
9. An investor buys a call at a price of $4 with an exercise price of 50. At what stock price will the investor break even on the purchase of the call __C____.
   a. 46
   b. 50
   c. 54
   d. 56
10. You establish a straddle on Intel using September call and put options with a strike price of $50. The call premium is $4 and the put premium is 4.5. what is the most you can lose on this position? ___C_____
    a. 4
    b. 4.5
    c. 8.5
    d. 58.5

2. Margin Trading

You are bearish on Yasoo and decided to sell short 100 shares at the current market prices of $50 per share. Broker's initial margin requirement is 40% of the value of the short position and maintenance margin is 35% of the value of the short position.

a. How much in cash or securities must you put into your brokerage account at the beginning?

100*50*40%=2000

b. How high can the price of the stock go before you get a margin call?

[2000-100*(P-50)]/100P=35%
p=51.8

3. Portfolio Theory

Lucy has a $800,000 fully diversified portfolio. She subsequently inherits ABC Company common stock worth $160,000. Her financial adviser provided her with the following estimates:

	Expected yearly Returns	Std. Dev. of Yearly Returns
Original portfolio	10%	12%
ABC Company	12%	15%

The correlation coefficient of ABC stock returns with the original portfolio returns is 0.40. The inheritance changes Grace's overall portfolio and she is deciding whether to keep the ABC stock. Assuming Lucy keeps the ABC stock, calculate the:

a. Expected return of her new portfolio which includes the ABC stock.

E(r)=10%*1/3+12%*2/3=10.3%

b. Standard deviation of her new portfolio which includes the ABC stock.

SD=((12*80/96)^2+(15*16/96)^2+2*(80/96)*(16/96)*12*15*0.4)^0.5=11.24%

4. Equity Analysis

You are an investment analyst that is analyzing the stock of ABC. In your examination of the company, you have also learned that the stock has a current EPS of $5.00 and that the Board of Directors has authorized a dividend payout ratio of 30%. In reviewing the company's financial statements, you estimate the company's return-on-equity at 10%.

You also conduct a regression analysis over the period 1997 to 2007 to obtain a better understanding of the stock's risk and performance vis-à-vis the general market (as represented by the S&P 500). In conducting your regression analysis in Excel, you note the following spreadsheet output:

SUMMARY OUPUT

Regression Statistics	
Multiple R	0.655540692
R Square	0.429733598
Adjusted R Square	0.424900832
Standard Error	0.098774962
Observations	120

ANOVA

	df	*SS*	*MS*	*F*	*Sifnificance F*
Regression	1	0.867555512	0.8675555	88.920835	4.49148E-16
Residual	118	1.151266185	0.0097565		
Total	119	2.018821697			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	0.007256663	0.009101636	0.797292200	0.4268828	-0.010767053	0.025280380
X Variable 1	1.942406695	0.20598633	9.429784500	4.491E-16	1.534497687	2.350315704

Moreover, you've checked in with your firm's economists and they are forecasting an expected market return of 15%. The current risk free rate is 5%.

a. What is the company's beta? Do you have any reason to believe that the beta is significantly different from the market's beta?

market beta is $\boxed{\beta_{i,m} = 1.942406695}$ Since 1 is not in the 95% confidence Interval of $\beta_{i,m}$, we have a good reason to believe that $\beta_i \neq \beta_m$

b. What percentage of the total variance in ABC is explainable by market (or systematic) risk?

$R^2 = 0.429733598$

Thus, $\boxed{42.97\%}$

c. Using CAPM assumptions, what is this stock's required rate of return?

$K = r_f + \beta[E(r_m) - r_f]$

$= .05 + 1.924406695(.15 - .05)$

$= .2442406695$

$K \approx 24.42\%$

d. What is this stock's anticipated growth rate?

$g = ROE(1 - dpr)$

$= .1(1 - .3)$

$= .07$

$g = 7.0\%$

e. Calculate the intrinsic value of this stock, using the assumptions above.

$V_0 = \frac{D_1}{K-g} = \frac{D_0(1+g)}{K-g}$; where $D_0 = EPS(dpr) = \$5.00(.3) = \$1.50$

$V_0 = \frac{\$1.5(1.07)}{(.2442406695 - .07)}$

$V_0 = \$9.211397113$

f. If management improves operations and the firm's ROE increases to 15% after year 2, what is the new intrinsic value of this stock?

$g_2 = ROE_2(1 - dpr) = .15(1 - .3) = .105$

$V_0 = \frac{D_0(1+g_1)}{1+K} + \frac{D_0(1+g_1)^2}{(1+K)^2} + \left(\frac{1}{(1+K)^2}\right)\frac{D_0(1+g_1)^2(1+g_2)}{(K-g_2)}$

$= \frac{1.5(1.07)}{(1.2442406695)} + \frac{1.5(1.07)^2}{(1.2442406695)^2} + \frac{1}{(1.2442406695)^2}\frac{(1.5)(1.07)^2(1.105)}{(.1392406695)}$

$V_0 = 1.289943368 + 1.109302595 + 8.803314235 = \$11.2025602$

5. Bond Pricing and Duration

You are analyzing the following bond: $1000 par value, 3 year, 7% semi-annual coupon, with
an 8% yield to maturity.

a. Using the bond pricing formula, calculate the exact price of this bond.

$$PV = 35\left[\frac{1-\frac{1}{(1.04)^6}}{.04}\right] + 1{,}000\left(\frac{1}{1.04}\right)^6$$

$PV = \$973.7893157$

b. Is this a premium or discount bond? Why?

Discount bond, because coupon rate is less than YTM.

c. Using the duration table, compute this bond's duration. Please remember that duration is reported in 'years'.

t	CF_t	$PV(CF_t)$	w_t	$t(w_t)$
1	35	33.65338465	.034383136	.034383136
2	35	32.35944746	.0324369207	.064873841 4
3	35	31.11487255	.030600868 6	.091802605 8
4	35	29.91814669	.028868744	.115474976
5	35	28.76744874	.027234664 1	.136173320 5
6	1035	817.9755341	.8357048023	5.014228814
Total:		978.7893157	1.00	5.456936694

$$\text{Annual Duration} = \frac{5.456936694}{2}$$

$$D = 2.728468347 \text{ years}$$

d. Using the bond pricing formula, calculate the exact price change of a 1% decrease in the yield to maturity (i.e., yields move to 7%).

$$PV' = 35\left[\frac{1-\left(\frac{1}{1.035}\right)^6}{.035}\right] + 1000\left(\frac{1}{1.035}\right)^6$$

$$= 1000$$

$$\boxed{\Delta P = 26.2106843}$$

e. Using the modified duration approach, calculate the approximate price change of a 1% decrease in the yield to maturity (i.e., yields move to 7%).

$$D^* = \frac{D}{1+Y} = \frac{2.728468347}{1.04} =$$

$$\Delta P = -D^*(\Delta Y)(P)$$

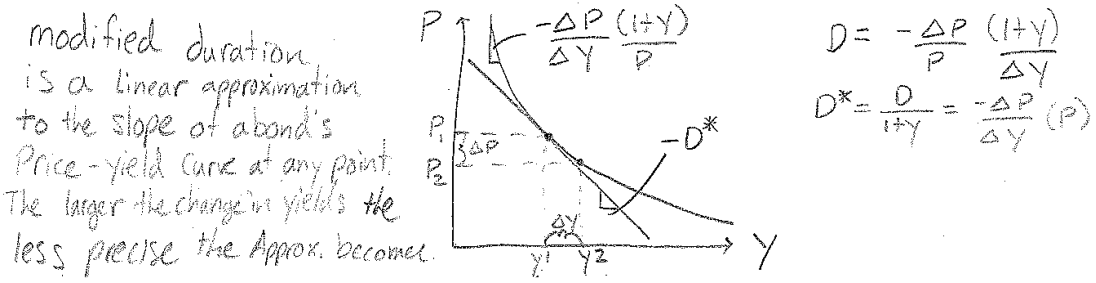
$$= (-2.623527256)(-.01)(973.7893157)$$

$$\boxed{\Delta P = 25.54762811}$$

f. What accounts for the difference, if any, between your answers to Q7 and Q8?

ΔP in Q15 was more accurate. The answer to Q16 was derived using modified duration, hence it is only an approximation to the actual yield sensitivity of the price of this bond.

g. Sketch the relationship between bond prices and yields, illustrating how using the modified duration approach can approximate the price change due to changing yields.



6. **Options**

The common stock of the P.U.T.T. Corporation has been trading in a narrow price range for the past month, and you are convinced it is going to break far out of that range in the next three months. You do not know whether it will go up or down, however. The current price of the stock is $90 per share, the price of a three-month call option with an exercise price of $90 is $6, and a put with the same expiration date and exercise price costs $5.

a. What would be a simple options strategy to exploit your conviction about the stock price's future movements?

long straddle

b. At what stock prices will you break even?

there are two breakeven price: 90-(5+6)=79 and 90+(5+6)=101

7. Futures

A two-year gold futures contract is selling for $955. Spot gold prices are $900 and the one-year risk-free rate is 4%.

a. What arbitrage opportunity is available to investors?

F0=900*(1+4%)^2=973.44

Which is different from 955, So there is an arbitrage opportunity.

b. What strategy should they use, and what will be the profits on the strategy

t=0		t=2
long future	0	St-955
short sell gold	900	(St)
deposit	-900	900*(1+4%)^2=973.44
	0	18.44