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BROCK UNIVERSITY
FACULTY OF BUSINESS
FNCE 2P91, Corporate Finance l
Fall 2013 Final Examination
December 14, 2013 (9:00a to 12:00p)
10 Pages

Name: _____

Student Number: _____ Course Section: _____

Please check the box next to your instructor:

☐ Onem Ozocak

☐ Lewis Stevenson

☐ Tatyana Sokolyk

☐ Geoff Hoover

Answer all questions on the examination paper and hand it in at the completion of the examination. No examination aids other than those specified are permitted. Use or possession of unauthorized materials will automatically result in the award of a zero grade for this examination.

Question	Marks	Awarded
1	20	
2	10	
3	6	
4	8	
5	6	
6	6	
7	4	
8	14	
9	20	
10	6	
Total	100	

Question 1. (20 marks)

1. (2 marks). The present value of the following cash flow stream is $9138 when discounted at 11% annually. What is the value of the missing (t = 3) cash flow?
Yearly Cash Flow: 1 $2,000 2 $ 3000 3 $? 4 $2,000

A. $3,500
B. $2,925
C. $4,000
D. $2500

2. (2 marks). You are evaluating two annuities. They are identical in every way, except that one is an ordinary annuity and the other is an annuity due. Which of the following is false?

A. The ordinary annuity will have a lower present value than the annuity due.
B. The ordinary annuity will have a lower future value than the annuity due.
C. The annuity due must have the same present value as the ordinary annuity due.
D. The two annuities differ in present value by the amount (1 + R).

3. (2 marks). Brock University needs to raise $100 million. Total flotation cost is 14%, debt-to-equity ratio is .33 and flotation of debt is 6%. What is the flotation cost of equity?

A. 8%
B. 17%
C. 14%
D. 20%

4. (2 marks). Using the information from question 3, calculate the total amount that needs to be raised.

A. $ 100 million
B. $ 114 million
C. $ 116 million
D. $ 14 million

5. (2 marks). You own 150 shares of Stock X, which has a price of $1 per share, and 50 shares of Stock Y, which has a price of $3 per share. What is the portfolio weight of Stock X?

A. 50%
B. 25%
C. 75%
D. 67%

6. (2 marks). An analysis of what happens to NPV estimates when only one variable is changed is called:

A. Forecasting analysis.
B. Scenario analysis.
C. Sensitivity analysis.
D. Simulation analysis.

7. (2 marks). Which of the following statements is true for discount bonds and relationship between interest rates and bond prices?

A. Direct relationship, Coupon Rate < YTM
B. Direct relationship, Coupon Rate > YTM
C. Inverse relationship, Coupon Rate > YTM
D. Inverse relationship, Coupon Rate < YTM

8. (2 marks). The stock of MTY Golf World currently sells for $133.75 per share. The firm has a constant dividend growth rate of 7% and just paid a dividend of $6.25. If the required rate of return is 12%, what will the stock sell for one year from now?

A. $127
B. $133
C. $149
D. $143

9. (2 marks). The benefits to diversifying from a one-stock to a two-stock portfolio will be greatest when the correlation between the two stocks is:

A. –1.0
B. 0.0
C. 0.5
D. 1.0

10. (2 marks) Bill plans to open a do-it-yourself dog-bathing centre in a storefront. The bathing equipment will cost $160,000. Bill expects the after-tax cash inflows to be $40,000 annually for seven years, after which he plans to scrap the equipment and retire to the beaches of Jamaica. Assume the required return is 17%. What is the project's IRR? Should it be accepted?

A. 12.2%; yes
B. 12.2%; no
C. 16.3%; yes
D. 16.3%; no

Question 2. (10 marks)

Brook Jansen 23, has just graduated from Brock, has obtained a job in Toronto and wishes to buy a house 7 years from now, at which time she expects the cost to be $750,000. She needs to save for a down payment, which is equal to 20 percent of the price of the house. She can earn 14 percent per year compounded quarterly throughout the seven years. She will receive a bonus of $25,000 in 4 years which she will put towards her down payment. How much does she need to save each year for the next six years, (assuming she is not going to make any contributions year 7) to have enough money for the down payment seven years from now? Also, she wants to retire at the age of 65 and wants to withdraw equal payments semi-annually 65 to 90. If she can earn a rate of 10% semi-annually and save $2,000 per month from age 40 to 65, how much can she withdraw each year?

$EMR_{pre} = \{[1+ (.14/4)]^4 - 1\} =$ 14.75%

$PV_6 = (.20)*750{,}000 / (1 + .1475)^1 =$ 130,718.95

$FV_6 = 25{,}000\ (1.1475)^2 =$ 32, 918.91

Required at t=6: 130,718.95 – 32,918.91 = 97,800.04

$$97{,}800.04 = C\ \frac{\{(1 + .1475)^6 - 1\}}{.1475} \qquad C = 11{,}243.10$$

$EAR_{post} = \{[1+ (.10/2)]^2 - 1\} =$ 10.25%

$ESR = \{1.1025^{(1/2)} - 1\} =$ 5%

$EMR = \{1.1025^{(1/12)} - 1\} =$ .81648%

$$FVA_{65} = 2{,}000\ \frac{\{(1 + 0.0081648)^{300} - 1\}}{0.0081648} = 2{,}563{,}992.42$$

$$CF_{(65-90)}: 2{,}563{,}992.42 = C\ \frac{(1 - 1.05^{-50})}{.05} \qquad C = 140{,}447.13$$

Question 3. (6 marks)

ABX has 150,000 bonds outstanding selling at 114.216% of face value with 7% annual coupon rate, and 9 years maturity. There are 1 million preferred shares of $12 outstanding with a current price of $126. There are 3.25 million common shares outstanding with a price of $85 a share and a beta of .97. The common stock paid a dividend of $2.20 last year and expects to increase the dividends by 6% annually. The tax rate is 40%. Market return is 11% and the T. bill rate is 3.5%.

C.S: 3.25M*85 = 276,250,000 P.S: 1M*126 = 126,000,000 B: 150,000*1,142.16 = 171,324,000

W_e = (276,250,000/573,574,000) = 48.16% W_d = (171,324,000/573,574,000) = 29.87%

1. What is the cost of equity based on the dividend growth model? (1 mark)

   $R_e = \frac{(2.20*1.06)}{85} + .06 =$ 8.74%

2. What is the cost of equity based on the security market line? (1 mark)

   R_e = .035 + .97*(.11 - .035) = 10.775%

3. What is the cost of financing using preferred stock? (1 mark)

   R_p = 12/126 = 9.52%

4. What is the after-tax cost of debt financing? (2 mark)

$$1{,}142.16 = 70\left(\frac{1-\left(\frac{1}{(1+YTM)}\right)\text{^}9}{YTM}\right)+\left(\frac{1000}{(1+YTM)\text{^}9}\right) = .05(1-.4) = \text{3\% After- Tax}$$

5. What is the Weighted Average Cost of Capital (WACC)? (1 mark)

$$WACC = (.4816*\frac{(.10775+.0874)}{2}) + (.2987*.03) + (1-.4816-.2987)*(.0952) = 7.69\%$$

Question 4. (8 marks)

Suppose the current risk-free rate of return is 3.6%. Company A has a beta of .89 and an expected rate of return of 10.5%. Assume that the CAPM holds.

1. What is the risk-premium on the market? (1 mark)

   .105 = .036 +.89$E_{(rm)}$ – .03204 $E_{(r_m)}$ = 11.35% Market risk-premium = .1135-.036 = 7.75%

2. Company B has a beta of 0.81. What is the expected return on company B? (1 mark)

   $R_e = .036 + .81*(.1135 - .036) = \boxed{9.88\%}$

3. Suppose you invested $100,000 in A and B stocks. The beta of your portfolio is .93. How much did you invest in each stock? What is the expected return on the portfolio? (3 marks)

   $\boxed{W_e + W_d = 1}$ $.93 = W_e*(.89) + (1- W_e)*(.81)$ $\boxed{W_e = 150\%, W_d = 1- W_e = 1 – 1.50 = - 50\%}$

   $W_e = 1.5*(100{,}000) = \boxed{\$150{,}000}$ $W_d = -.5*(100{,}000) = -\$50{,}000$
   $E(_{rp}) = 1.5*(.105) + -.5(.0988) = \boxed{10.81\%}$

4. Suppose you have $100,000 to invest. The debt-to-equity ratio is 1.35. How much did you invest in Equity and Debt? What does debt-to-equity ratio tell us? (3 marks)

   E = 1 D = 1.35 V = $\boxed{2.35}$ E = (100,000)*(.4255) = $\boxed{\$42{,}553.19}$
   D = (100,000)*(.5745) = $\boxed{\$57{,}446.81}$

   *For every dollar you have in equity you have 35 cents in debt.

Question 5. (6 marks)

2008	2009	2010	2011	2012
-13%	26%	14%	18%	11%

1. What is the arithmetic return? (1 mark)

$$\text{Return} = \frac{-.13 + .26 + .14 + .18 + .11}{5} = \boxed{11.20\%}$$

2. The variance and the standard deviation for the stock? (2 marks)

$$\text{Var} = \frac{(-.13-.112)^2 + (.26-.112)^2 + (.14-.112)^2 + (.18-.112)^2 + (.11-.112)^2}{(5-1)} = \sqrt{.02147} = \boxed{14.65\%\text{S.D}}$$

3. What is the geometric return? (1 mark)

$\{[(1-.13)*(1.26)*(1.14)*(1.18)*(1.11)]^{(1/5)} - 1\} = \boxed{10.36\%}$

4. What are the real arithmetic and geometric returns if inflation is 3.5%? (2 marks)

   $(1.1120) = (1 + r)*(1.035)$ $\boxed{r = 7.44\%}$
   $(1.1036) = (1 + r)*(1.035)$ $\boxed{r = 6.63\%}$

Question 6. (6 marks)

A&B Group just paid $6 dividend and will pay $9 in the coming year. You expect to be able to grow the coming dividend at an annual rate of 10% for the next 4 years after which point you expect to be able to grow dividends at an annual rate of 3%. Assume that the market requires a 16% return. What would you determine the value of your shares to be?

$$P_0 = \left(\frac{9}{.16-.10}\right)*\left(1-\left(\frac{1.10}{(1.16)}\right)\text{^}4\right)+\left(\left(\frac{9*(1.10)\text{^}4*(1.03)}{.16-.03}\right)*(1.16\text{^}{-4})\right) = \boxed{\$86.37}$$

Question 7. (4 marks)

JP Morgan has issues 12 year bonds with 9% coupon rate (paid quarterly). If the appropriate discount rate is 7% on similar bonds, what is the price of JP Morgan bonds? If JP Morgan needs to raise $50 million how many bonds will they issue and what are the cash flows at maturity?

$$P_0 = 22.50\left(\frac{1-\left(\frac{1}{(1+.0175)}\right)\text{^}48}{.0175}\right)+\left(\frac{1000}{(1+.0175)\text{^}48}\right) = \boxed{\$1{,}161.57}$$

$$\#\text{ of bonds} = \frac{50{,}000{,}000}{1{,}161.47} = \boxed{43{,}048.93}$$

$$\text{CF at Maturity: } 43{,}048*(1000+22.50) = \boxed{\$44{,}017{,}532.72}$$

Question 8. (14 marks)

An analyst has just forecasted the following possible outcomes for next year:

State	**Probability**	**R_a**	**R_b**
Boom	20%	47%	25%
Moderate	50%	19%	11%
Recession	30%	-13%	4%

1. Calculate the expected returns of stock A, stock B. (1 mark)

$$R_a = .20*(.47)+.5*(.19)+.3(-.13) = \boxed{15\%}$$
$$R_b = .20*(.25)+.5*(.\ 11)+.3(.04) = \boxed{11.7\%}$$

2. Calculate the standard deviation of returns for both stock A and stock B. (2 marks)

$$\text{Var}_a = .20*(.47-.15)^2+.5*(.19-.15)^2+.3(-.13-.15)^2 = \sqrt{.0448} = \boxed{21.17\%}$$

$\text{Var}_b = .20*(.25-.117)^2 + .5*(.\ 11-.117)^2 + .3(.04-.117)^2 = \sqrt{.005341} = \boxed{7.31\%}$

3. Create a portfolio consisting of 60% invested in stock A and the remainder in stock B calculate the expected return and standard deviation of the portfolio. (4 marks)

$R_p = .6*(.15) + .4*(.117) = \boxed{13.68\%}$

$R_b = .6*(.47) + .4*(.25) = \boxed{38.2\%}$ $R_m = .6*(.19) + .4*(.11) = \boxed{15.8\%}$ $R_r = .6*(-.13) + .4*(.04) = \boxed{-6.2\%}$

$\text{Var}_p = .2*(.382-.1368)^2 + .5*(.158-.1368)^2 + .3*(-.062-.1368)^2 = \sqrt{.0241} = \boxed{15.53\%\ \text{S.D}}$

4. How would the standard deviation of the portfolio change, if stocks A and B were perfectly negatively correlated (r = -1)? ((2 marks)

$\text{Var}_p = (0.60)^2 *.0448 + (0.40)^2 * 0.005341 + (2*0.60*0.40*-1*.2117*0.0731) = 0.009518$

$\text{S.D}_p = \sqrt{0.009518} = \boxed{9.76\%}$

5. You desire 20% return on your portfolio what weights would you assign? (2 marks)

$.20 = W_a*(.15) + (1- W_a)*(.117)$ $W_a = \boxed{251.52\%}$ $W_b = 1 - 2.5152 = -1.5152 = \boxed{-151.52\%}$

6. If market return is 8% and T. Bill rate is 3% which stock has higher systematic, unsystematic, and total risk. (3 mark)

$.15 = .03 + \beta_a*(.08-.03)$ $\beta_a = \boxed{2.4}$ $\text{Var}_a = \boxed{4.48\%}$ $\text{S.D}_a = \boxed{21.17\%}$

$.117 = .03 + \beta_b*(.08-.03)$ $\beta_b = \boxed{1.74}$ $\text{Var}_b = \boxed{.5341\%}$ $\text{S.D}_b = \boxed{7.31\%}$

Question 9 (20 marks)

1. The SFG group wants to purchase a new machine to improve production. It will cost $6 million and it has a life of 25 years at which point the value of the machine will be $0; the firm uses straight-line method. Initial net working capital (NWC) is $300,000. NWC recovery schedule: $0, $45,000, $65,000, $85,000, $105,000. Revenue will increase by $1,000,000 per year. The firm's tax bracket is 35 percent, and the required rate of return on the project is 12 percent. What is the NPV of the project? Should the project be accepted? (13 marks)

$$\text{PV NWC} = \frac{45{,}000}{1.12^2} + \frac{65{,}000}{1.12^3} + \frac{85{,}000}{1.12^4} + \frac{105{,}000}{1.12^5} = \boxed{\$195{,}738.30}$$

$$\text{PV Revenue} = 1{,}000{,}000\left[\frac{1-\left(\frac{1}{1.12^{25}}\right)}{.12}\right] x(1-.35) = \boxed{\$5{,}098{,}040.42}$$

$$\text{Annual Depreciation} = \frac{(6{,}000{,}000 - 0)}{25} = \boxed{\$240{,}000}$$

$$\text{PV Depreciation} = 240{,}000\left[\frac{1-\left(\frac{1}{1.12^{25}}\right)}{.12}\right]\text{x}(.35) = \boxed{\$658{,}823.69}$$

$$\text{NPV} = -6{,}000{,}000 - 300{,}000 + 195{,}738.30 + 5{,}098{,}040.42 + 658{,}823.69 = \boxed{-\$347{,}397.59}$$

NPV is negative therefore, reject the project.

2. If the equipment falls into class 8 (CCA rate = 20 percent) and salvage value is $900,000. Should this project be accepted? Calculate EAC. (7 marks)

$$\text{Pv Tax Shield on CCA} = \left[\frac{IdT_c}{d+k}\right]\text{x}\left[\frac{1+.5k}{1+k}\right] - \left[\frac{S_n dT_c}{d+k}\right]\text{x}\left[\frac{1}{(1+k)^T}\right]$$

$$\text{PV CCA} = \left[\frac{6{,}000{,}000*.20*.35}{(.2+.12)}\right]\text{X}\left[\frac{1+.5(.12)}{1+.12}\right] - \left[\frac{900{,}000*.20*.35}{(.2+.12)}\right]\text{X}\left[\frac{1}{1+.12^{25}}\right]$$

$$\text{PV CCA} = \boxed{\$1{,}230{,}606.66}$$

$$\text{PV Salvage} = \frac{900{,}000}{(1+.12)^{25}} = \boxed{\$52{,}940.98}$$

$$\text{NPV} = -6{,}000{,}000 - 300{,}000 + 195{,}738.30 + 5{,}098{,}040.42 + 1{,}230{,}606.66 + 52{,}940.98$$

$$\text{NPV} = \boxed{\$277{,}326.36}$$

NPV is positive therefore, accept the project.

$$277{,}326.36 = \text{EAC}\left[\frac{1-\left(\frac{1}{1.12^{25}}\right)}{.12}\right] = \boxed{\$35{,}359.10}$$

Question 10 (6 marks)

You have a portfolio that is worth $10 million, has a beta of 4.07, and return of 27%. Solve for the unknown variables and calculate the return on the portfolio.

Asset	Amount	Beta	Return
A	$2.4M	3.2	20%
B	3.2M	1.4	18%
C	1.22M	.33	6%
D		4.7	
E	1M	1.13	5%
Risk-Free			4%

$$4.07 = (.24)*(3.2) + (.32)*(1.4) + (.122)*(.33) + (W_d)*(4.7) + (.10)*(1.13) + (W_{rf})*(0)$$

$W_d =$ 57.46% Amount in D = .5746*(10,000,000) = $5,746,255.32

$$W_{rf} = 1 - .24 - .32 - .122 - .5746 - .10 = \text{-}35.66\%$$

Amount in Risk-free = -.3566*(10,000,000) = -$3,566,000

$$.27 = (.24)*(.2) + (.32)*(.18) + (.122)*(.06) + (.5746)*(R_d) + (.10)*(.05) + (\text{-}.3566)*(.04)$$

$R_d =$ 28.95%