

Solutions

Print Last Name: ➔	Print First Name: ➔	ID Number: ➔	
COURSE FINANCE	NUMBER COMM 308	SECTIONS: (➔ Circle your section) CA, CB	
EXAMINATION Final Exam VERSION BLUE	DATE August 17, 2012	TIME 3 hours 19:00 to 22:00	# OF PAGES 18 including cover
INSTRUCTOR: (➔ Underline your instructor's name) Mahmood Mohebshahedin Rahul Ravi		DIVISION John Molson School of Business Concordia University	

READ THESE SPECIAL INSTRUCTIONS CAREFULLY

- You must submit a BLUE computer answer sheet.
- You are allowed to bring/use one or more calculators
- You are allowed to bring one language dictionary (no finance/ mathematics/economics etc. dictionary)
- For **Multiple Choice Questions:** All answers must be recorded **IN PENCIL** on the computer sheet.
- For **Problems:**
 - All answers must be recorded **IN INK** within this exam.
 - Show your calculations to earn part marks. Unsupported answers will not receive any credit.
 - Write in the space provided. If you are using the back of the exam for answering any question, you should label it clearly
- Please ensure you have **18 pages** (including the cover page) in this exam.
- Fill in your name and other required information **IN PENCIL** on the Computer Answer sheet as well as **IN INK** on this cover sheet.
- Blank questions or those with multiple answers will not receive any credit.

SCORES (FOR INTERNAL USE ONLY)

Part I Multiple Choice Questions	Part II Long Answer Questions				Total
	Question 1	Question 2	Question 3	Question 4	
(Max: 70 Points)	(Max: 12 Points)	(Max: 8 Points)	(Max: 6 Points)	(Max: 4 Points)	

Part I: Questions à choix multiples (28 Questions, 70 Points):

- This part consists of 28 Multiple Choice Questions.
- Each question is worth 2.5 points for a total of 70 points.
 - **Only answers on the computer answer sheet will be graded.**
 - **Use a pencil to mark your answers on the Computer Sheet.**

1. Suppose that Chloe borrows \$300,000 from the First National State Bank at 2.5 percent interest compounded annually to purchase a new home. Chloe agrees to repay the loan in 30 equal annual installments, with the first payment due at the end of the first year. Chloe's annual payment is closest to _____.

- A. \$14,333.25.
- B. \$15,666.35.
- C. \$16,777.45.
- D. \$17,888.55.
- E. None of the above.

$$300,000 = \frac{PMT}{0.025} \times \left[1 - \frac{1}{1.025^{30}} \right]$$

$$PMT = \$14,333.25$$

2. Suppose that the payback period for a particular project is 5 years and 6 months. If the annual cash inflows are \$5,000, then the initial investment is:

- A. \$22,500.
- B. \$24,000.
- C. \$27,500.
- D. \$29,000.
- E. None of the above.

$$5.5 * 5000 = \$27,500$$

3. The internal rate of return (IRR) is:

- A. The same thing as the discount rate.
- B. The same thing as the cost of capital.
- C. The discount rate that equates the present values of inflows and outflows.
- D. The rate that makes crossover equal to zero.
- E. The ratio of average annual profits to average investments.

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4. Project A and Project B are mutually exclusive. Project A has an IRR of 10 percent. Project B has an IRR of 12 percent. The crossover rate is 7%. Both projects have standard cashflow, (i.e. investment at time zero followed by a series of cash inflows). If the firm's marginal cost of capital is 6 percent, then:
- A. Project A should be accepted and Project B rejected.
 - B. Project B should be accepted and Project A rejected.
 - C. Both projects should be accepted.
 - D. Both projects should be rejected.
 - E. Decision should be based on NPV and not IRR. Given the information in this question, it is impossible to make a decision.
5. Automobile insurance companies attempt to reduce the problem of moral hazard by:
- A. Refusing to insure bad drivers.
 - B. Offering liability insurance to drivers with bad driving records, but refusing to offer collision insurance.
 - C. Requiring a deductible on insurance claims.
 - D. Offering no-fault insurance.
 - E. By segmenting the market into low risk and high-risk groups.
6. In your opinion security A has an expected rate of return of 12.5%. It has a beta of 1.5. The risk-free rate is 4% and the market expected rate of return is 11%. According to the Capital Asset Pricing Model, this security is _____
- A. underpriced. $E(r_{CAPM}) = 0.04 + 1.5 * 0.07$
 - B. overpriced. $= 14.5\% > 12.5\%$
 - C. fairly priced. $\Rightarrow \text{Overpriced}$
 - D. cannot be determined from data provided.
 - E. none of the above.
7. Which of the following forms of market efficiency (if proven valid) would make government regulations prohibiting trading on insider information unnecessary?
- A. Weak
 - B. Semi-strong
 - C. Technical
 - D. Strong
 - E. None of the above

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8. Bach Airline is expected to pay a dividend of \$8 in the coming year. Dividends are expected to grow at the rate of 15% per year. The risk-free rate of return is 6% and the expected return on the market portfolio is 14%. The stock of Bach Airline has a beta of 3.00. The price (intrinsic value) of the stock is _____.

A. \$53.33

$$g = 15\% \quad r_f = 6\% \quad r_m = 14\% \quad \beta = 3\%$$

B. \$50.00

$$E(r) = 0.06 + 3 * 0.08 = 30\%$$

C. \$56.00

$$P_0 = \frac{8}{0.3 - 0.15} = \$53.33$$

D. \$62.50

E. None of the above.

9. Which of the following is true regarding the concept of beta?

A. To benefit from an upcoming bull market, you need to invest in high beta stocks.

B. Treasury bills have a beta of 1.

C. Total risk equals beta risk plus systematic risk.

D. You can form a zero-beta portfolio by investing in as many stocks as you can afford.

E. All assets with beta of 1 may be used as a market proxy.

10. If a firm has a required rate of return equal to ROE

A. The firm can increase market price and P/E by retaining more earnings.

B. The firm can increase market price and P/E by increasing the growth rate.

C. The amount of earnings retained by the firm will not affect market price or the P/E.

D. A and B.

E. None of the above.

11. Which of the following statements is most correct?

A. Risk refers to the chance that some unfavorable event will occur.

B. Portfolio diversification reduces the variability of returns on an individual stock.

C. When company-specific risk has been diversified, the inherent risk that remains is market risk which is constant for all securities in the market.

D. A stock with a beta of -1.0 has zero market risk.

E. The SML relates required returns to firms' market risk. The slope and intercept of this line cannot be controlled by the financial manager.

12. Given the following probability distribution, what are the expected return and the standard deviation of returns for security J?

State	p_i (Probability)	k_i	$p_i * k_i$	$k_i - E(k_i)$	$p_i * (k_i - E(k_i))^2$
1	0.2	10%	0.02	-0.05	0.0005
2	0.6	15%	0.09	0	0
3	0.2	20%	0.04	0.05	0.0005

A. 12%; 5.18%

B. 15%; 3.16%

C. 15%; 6.50%

D. 15%; 10.00%

E. 20%; 5.00%

$$E(k) = \sum(p_i \times k_i) = 0.15$$

$$\sigma = \sqrt{\sum(p_i \times (k_i - E(k))^2)} = \sqrt{0.001} = 0.03162$$

13. Which of the following has the greatest interest rate risk?

A. A 10-year, \$1000 face value, 10% coupon bond with semi-annual interest payments.

B. A 10-year, \$1000 face value, 10% coupon bond with annual interest payments.

C. A 10-year, \$1000 face value, zero coupon.

D. A 10-year, \$100 annuity.

E. All the above have the same interest rate risk since they all mature in 10 years.

14. Which of the following statements is most correct?

A. If a bond sells for less than par, then its yield to maturity is less than its coupon rate.

B. If a bond sells at par, then its current yield will be less than its yield to maturity.

C. A bond selling at premium will have a higher capital gain relative to a bond that sells at par. (Assume both bonds have T years to maturity)

D. Statements A and C are correct

E. None of the above statements are correct.

15. Which of the following equations is correct?

A. $PV(\text{Annuity Due}) = PV(\text{Annuity}) * (1+k)$

B. $PV(\text{Annuity Due}) = PV(\text{Annuity}) / (1+k)$

C. $FV(\text{Annuity Due}) = FV(\text{Annuity}) / (1+k)$

D. $FV(\text{Annuity Due}) = PV(\text{Annuity}) * (1+k)^{(n-1)}$

E. A and D

16. Assume that you wish to purchase a 20-year bond that has a maturity value of \$1,000 and makes semi-annual interest payments of \$40. If you require a 10% per annum nominal yield to maturity (5% effective semiannual yield) on this investment, what is the maximum price you should be willing to pay for the bond?

- A. \$489
 B. \$674
 C. \$761
 D. \$828
 E. \$902
- $T = 20 \text{ years} \Rightarrow n = 40$
 $F = 1000 \quad C = 40 \quad k = 0.05$
 $P = \frac{40}{0.05} * \left[1 - \frac{1}{1.05^{40}} \right] + \frac{1000}{1.05^{40}} = 828.41$

17. Which of the following statements is true regarding a call writer?

- A. The call writer expects the stock to move upward.
 B. The call writer expects the stock to remain the same or move down.
 C. The call writer expects the stock to be more volatile.
 D. The call writer expects to sell the stock prior to expiration of the option.
 E. The call writer can offset his potential loss by buying and holding a put option on the same stock, same expiration date and same strike price as his short call.

18. The weighted average cost of capital for a firm is the:

- A. discount rate which the firm should apply to all of the projects it undertakes.
 B. rate of return a firm must earn on its existing assets to maintain the current value of its stock.
 C. coupon rate the firm should expect to pay on its next bond issue.
 D. maximum rate which the firm should require on any projects it undertakes.
 E. None of the above.

19. Assume you are to receive a 20-year annuity with annual payments of \$50. The first payment will be received at the end of Year 1, and the last payment will be received at the end of Year 20. You will invest each payment in an account that pays 10 percent. What will be the value in your account at the end of Year 30?

- A. \$1,000
 B. \$6,354.81
 C. \$6,752.57
 D. \$7,427.83
 E. \$8,170.61
- $PMT = 50 \quad n = 20 \quad k = 0.1$
 $FV_n = \frac{50}{0.1} * [1.1^{20} - 1] * 1.1^{10}$
 $= 7427.83$

20. You are interested in investing your money in a bank account. Which of the following banks provides you with the highest effective rate of interest?

- A. Bank 1; 8 percent with monthly compounding. $EAR = \left(1 + \frac{0.08}{365}\right)^{365} - 1 = 8.33\%$
- B. Bank 2; 8 percent with annual compounding.
- C. Bank 3; 8 percent with quarterly compounding.
- D. Bank 4; 8 percent with daily (365-day) compounding.**
- E. Bank 5; 8.24 percent with annual compounding.

21. A buyer can afford no more than \$500 per month in payments. The most favorable loan available in the market is a 30-year loan at 10% (APR compounded semiannually). What is the maximum affordable house with a 10% down payment? (Pick the closest number)

- A. \$55,000
- B. \$57,959
- C. \$64,399**
- D. \$65,679
- E. 180,000
- $$k = \left(1 + \frac{0.1}{2}\right)^{\frac{2}{12}} - 1 = 0.008165$$
- $$PV = \frac{500}{0.008165} * \left[1 - \frac{1}{1.008165^{360}}\right] = 57959.73$$
- $$0.9 \times x = 57959.73 \Rightarrow x = 64399.69$$

22. A statistic that measures how two variables tend to move together is the

- A. Correlation coefficient**
- B. Standard deviation
- C. Mean
- D. Variance
- E. None of the above

23. Which of the following asset classes would give you the greatest probability of achieving a return that is closest to its expected return?

- A. Treasury Bills**
- B. Corporate Bonds
- C. Common Stocks
- D. Preferred Stocks
- E. A fully diversified portfolio

24. In a typical loan amortization schedule, the dollar amount of interest paid each period will _____.

- A. increases with each payment
- B. decreases with each payment**
- C. remains constant with each payment
- D. increase or decrease depending on the term of amortization
- E. depend on the interest rate prevailing in the market during that period

25. Adaptomatic Corp. has just issued their latest financial statements. The balance sheet contains the following information. Which one of the following statements is true?

	Beginning	Ending
Accounts receivable	\$1,300	\$1,400
Inventory	\$2,000	\$1,800
Accounts payable	\$1,700	\$1,600
NWC	\$1600	\$1,600

- A. Inventory required a use of cash during the period.
- B. Accounts receivable was a source of cash during the period.
- C. Net working capital decreased by \$200 during the period.
- D. Net working capital increased by \$200 during the period.
- E. There was no change in net working capital.**

26. A firm purchases Class 8 equipment for \$1,000,000 (CCA Rate 20%) for a 10-year project. What will be the CCA tax shield in year 3? The tax rate is 35%.

- A. \$35,000
- B. \$50,400**
- C. \$63,000
- D. \$144,000
- E. \$201,600

Year	UCCB	CCA	TS
1	1,000,000	100,000	
2	900,000	180,000	
3	720,000	144,000	50,400

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27. Nathan's is considering offering boots for sale along with their current lines of shoes and slippers. The projected annual sales for the company, with and without boots, are as follows:

Product	Without boots	With boots	Difference
Shoes	\$289,400	\$271,850	-17,550
Slippers	\$54,950	\$53,900	-1,050
Boots	\$0	\$46,800	46,800

What amount should be used as the annual sales figure when evaluating the addition of boots to the product line?

- A. \$28,200
 - B. \$46,800 $46,800 - 1,050 - 17,550 = 28,200$
 - C. \$344,350
 - D. \$372,550
 - E. \$400,750
28. Which of the following statements is true?
- A. For both calls and puts an increase in the exercise price will cause an increase in the option price.
 - B. For both calls and puts an increase in the risk free rate will cause an increase in the option price.
 - C. For calls, but not for puts, an increase in the time to maturity will cause an increase in the option price.
 - D. For puts, but not for calls, a decrease in the price of the underlying stock will cause an increase in the option price.
 - E. If the riskiness of the underlying asset decreases, then the Value of both the put and the call option will increase.

This is question 43, chapter 7 of textbook.

Q1 Part b) (7 Points) Equity valuation

Note: Information from part (a) should not be used in part (b)

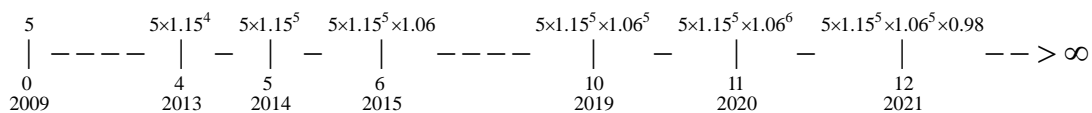
Cheers Inc. had earnings per share of \$5 as of December 31, 2009. Earnings were expected to grow at 15% per year for the following five years. Earnings growth will be 6% per year for the next six years (that is, from January 1, 2015 through to December 31, 2020). After December 31, 2020, earnings will start declining at the rate of 2% per year in perpetuity.

Cheers Inc. will not pay any dividend up to and including December 31, 2013. Starting January 1, 2014 the firm will pay 50% of its earnings as dividends for the next 6 years (Thus the first dividend will be paid out on 31st of December 2014). Starting on December 31, 2020, Cheers Inc. will begin to pay out 80% of its earnings in dividends. This payout ratio is expected to continue for all foreseeable future. Assume that the required rate of return on Cheers Inc. stock is 10% (EAR).

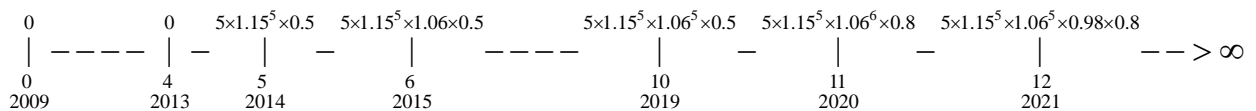
What should be the price of Cheers' share on December 31, 2012?

Solution:

Earnings :



Dividends :



Dividends form:

From 5 till 10 → 6 period growing annuity.

n=6

$$PMT_1 = D_5 = 5 * 1.15^5 * 0.5$$

g = 6%

k = 10%

From 11 to infinity → Growing perpetuity

$$PMT_1 = D_{11} = 5 * 1.15^5 * 1.06^6 * 0.8$$

g = -2%

k = 10%

$$PV_4^{GrowingAnnuity} = \frac{5 \times 1.15^5 \times 0.5}{0.1 - 0.06} \times \left[1 - \left(\frac{1.06}{1.1} \right)^6 \right] = 25.05$$

$$PV_{10}^{GrowingPerpetuity} = \frac{5 \times 1.15^5 \times 1.06^6 \times 0.8}{0.1 + 0.02} = 95.10495$$

December 31, 2012 is time 3 on the above timeline.

To get the price at t=3,

Discount the PV of the growing annuity by one period (From 4 to 3)

Discount the PV of the growing perpetuity by seven periods (From 10 to 3)

$$PV_{Dec31,2012} = \frac{25.05}{1.1} + \frac{95.10495}{1.1^7} = 22.773 + 48.804 = \$71.58$$

Q2. (8 Points) This question has two related parts. Information from (i) may be used in (ii)

Kicking Horse Lodge (KHL) is looking at two different models for its next theme attraction: indoor roller coasters. The incremental cash flows of the two models are listed below (in \$ thousands).

Year	0	1	2	3	4	5	6	7
Dragonroll	-200	-4	-4	-4	-4	-4	-4	-4
Pythonroll	-100	-2	-2	-2	-2			

KHL plans to continue with the model it chooses for the foreseeable future (i.e. it will reinvest in the chosen model when the previous model needs to be replaced.)

KHL is financed with \$50 million in risky debt (currently with a YTM of 6.5%) and \$100 million in equity (with a beta of 1.10). This roller coaster investment can be considered a scale-expansion of the existing business.

Assume: Return on the market: 12%
 Risk-free rate: 3%
 Corporate tax rate: 35%

i. What is KHL's WACC? Is WACC appropriate for analyzing the above project?
 The question provides incremental cash flows. It does not talk about the

Solution: initial new capital expenditure. Therefore, assume: The cash-flows are adjusted for CCA tax shields

Since this is a scale expansion, we can use the WACC for analyzing the project.

$$E(k_e) = r_f + \beta_e (r_m - r_f) = 0.03 + 1.1 \times (0.12 - 0.03) = 0.129$$

$$WACC = \left(\frac{50}{50+100} \right) \times 0.064 \times (1-0.35) + \left(\frac{100}{50+100} \right) \times 0.129 = 0.10$$

ii. Which roller coaster should they choose? Show all your work.

Solution:

Since these are investments with different lives that will be repeated, we need to use either EANPV or take each investment to the common ending period. Here is the solution for EANPV:

For Dragonroll:

$$PV = -200 + \frac{-4}{0.10} \times \left(1 - \frac{1}{1.1^7}\right) = -219.47$$

$$-219.47 = \frac{EANPV}{0.1} \times \left(1 - \frac{1}{1.1^7}\right)$$

$$\therefore EANPV_D = -45.08$$

For Pythonroll:

$$PV = -100 + \frac{-2}{0.10} \times \left(1 - \frac{1}{1.1^4}\right) = -106.34$$

$$-106.34 = \frac{EANPV}{0.1} \times \left(1 - \frac{1}{1.1^4}\right)$$

$$\therefore EANPV_P = -33.55$$

Pythonroll has lower EANPV (equivalent annual cost) and therefore KHL should choose Pythonroll.

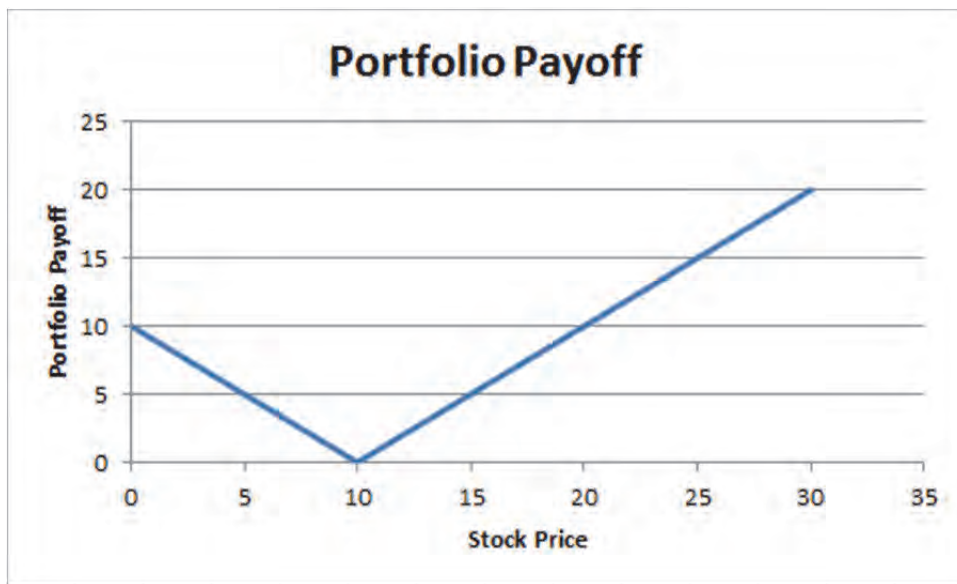
Q3. (6 Points) Option portfolio Payoff: Suppose that the price of a share of stock in XYZ Corporation is currently \$10. Consider buying a call option AND a put option on one share of XYZ and the strike prices of both options is \$10.

- i. (5 Points) Draw a payoff diagram of this portfolio.
Note: Clearly label both axes and the location of each important point on the diagram (Points of intersections, points where the graph changes direction, etc.).

Payoff Matrix:

Stock Price	0	10	30
Long Call	0	0	20
Long Put	10	0	0
Portfolio Payoff	10	0	20

Payoff Diagram:



- ii. (1 Point) What is the holder of this portfolio betting on?

He is betting on high volatility (Either the prices will fall below \$10 or rise above \$10. Greater the movement, higher will be the payoff).

Q4. (4 Points) Short Answers:

- a) (2 Points) In finance, what is meant by “agency problem”? Explain and give an example.

Agency problem refers to problems arising due to potential misalignment between the interests of owners, creditors, and managers.

For example: Managers have incentives to authorize the use of the firm’s money on projects that are beneficial to the managers but not the firm. For example, the managers may authorize the expansion of their offices or purchase of corporate jets

- b) (2 Points) If beta measures just systematic risk and standard deviation measures total risk, then how can something have a beta of 1.2, but a standard deviation of only 0.3?

The two measures of risk are different in the units that they measure. Standard deviation measures in percentage unit. For example, a standard deviation of 0.3 is the same as 30%. Beta is scaled by the market’s standard deviation. Therefore, beta is measured relative to the market. It is not in units of percent.

Therefore, the two numbers cannot be compared to each other.

Equation List - Comm 308 - Booth-Cleary Text

5.3	Present Value of FV_n : $PV_0 = \frac{FV_n}{(1+k)^n}$
5.4	Future value of an annuity: $FV_n = \frac{PMT}{k} \left[(1+k)^n - 1 \right]$
5.5	Present Value of an annuity: $PV_n = \frac{PMT}{k} \left[1 - \frac{1}{(1+k)^n} \right]$
5.8	Present value of perpetuity: $PV_0 = \frac{PMT}{k}$
5.10	Effective rate with continuous compounding: $k = e^{QR} - 1$
5.11	Effective rate: $k = \left(1 + \frac{QR}{m} \right)^m - 1$
5A-2	Present value of growing perpetuity: $PV_0 = \frac{PMT_0(1+g)}{k-g} = \frac{PMT_1}{k-g}$
5A-4	Present value of growing annuity: $PV_0 = \frac{PMT_1}{k-g} \left[1 - \left(\frac{1+g}{1+k} \right)^n \right]$
6.3	Current Yield: $CY = \frac{\text{Annual Interest}}{B}$
6.6	Price of T-Bill given BEY: $P = \frac{F}{\left(1 + k_{BEY} \times \frac{n}{365} \right)}$
7.10	Share price with growth opportunities: $P_0 = \frac{EPS_1}{k_c} + PVGO$
7.11	Growth rate: $g = b * ROE$
8.3	Total return = Income yield + Capital gain (loss) yield = $\frac{CF_1}{P_0} + \frac{P_1 - P_0}{P_0}$
8.5	Geometric average (GM) = $\left[(1+r_1)(1+r_2)(1+r_3) \dots (1+r_n) \right]^{1/n} - 1 = \left(\prod_{i=1}^n (1+r_i) \right)^{\frac{1}{n}} - 1$
8.6	Expected return: $ER = \sum_{i=1}^n (r_i * \text{Prob}_i)$
8.7	Ex-post $\sigma = \sqrt{\frac{\sum_{i=1}^n (r_i - \bar{r})^2}{n-1}}$
8.8	Ex-ante $\sigma = \sqrt{\sum_{i=1}^n (\text{Prob}_i)(r_i - ER)^2}$
8.9	Expected portfolio return: $ER_p = \sum_{i=1}^n (w_i * ER_i)$
8.11	Portfolio standard deviation: $\sigma_p = \sqrt{(w_A)^2(\sigma_A)^2 + (w_B)^2(\sigma_B)^2 + 2(w_A)(w_B)(COV_{A,B})}$
8.12	$COV_{A,B} = \sum_{i=1}^n \text{Prob}_i (r_{A,i} - \bar{r}_a)(r_{B,i} - \bar{r}_b)$

8.14	$COV_{AB} = \rho_{AB} \sigma_A \sigma_B$
8.16	If $\rho_{AB} = -1$, then: $\sigma_P = w\sigma_A - (1-w)\sigma_B$
9.3	$E(R_P) = RF + \left(\frac{E(R_A) - RF}{\sigma_A} \right) \sigma_P$
9.4	Slope of CML = $\frac{ER_M - RF}{\sigma_M}$
9.6	Sharpe Ratio = $\frac{ER_P - RF}{\sigma_P}$
9.7	$\beta_i = \frac{Cov_{i,M}}{\sigma_M^2} = \frac{\rho_{i,M} \sigma_i}{\sigma_M}$
9.8	$\beta_P = w_A \beta_A + w_B \beta_B + \dots + w_n \beta_n$
9.9	$k_i = RF + (ER_M - RF) \beta_i$
12.2	Option Premium = $IV + TV$
12.5	Put Call Parity: $P + S = C + PV(X)$
13.1	$NPV = \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \frac{CF_3}{(1+k)^3} + \dots + \frac{CF_n}{(1+k)^n} - CF_0 = \sum_{t=1}^n \frac{CF_t}{(1+k)^t} - CF_0$
13.3	$PI = \frac{PV(\text{Cash inflows})}{PV(\text{Cash outflows})}$
14.1	$CF_0 = C_0 + \Delta NWC_0 + OC$
14.2	$CF_t = CFBT_t(1-T) + CCA_t(T)$
14.4	$ECF_n = SV_n + \Delta NWC_n$
14.5	$NPV = PV(CF_t) + PV(ECF_n) - CF_0$
14.6	$PV(\text{Operating Cash Flows}) = \frac{CFBT(1-T)}{k} \left[1 - \frac{1}{(1+k)^n} \right]$
14.7	$PV(\text{CCA Tax Shield}) = \frac{(C_0)(d)(T)}{d+k} * \frac{(1+0.5k)}{(1+k)} - \frac{(SV_n)(d)(T)}{d+k} * \frac{1}{(1+k)^n}$
20.8	Cost of Capital: $K_a = \frac{ROI \times IC}{V} = \frac{K_e S + K_d(1-T)D}{V} = K_e \frac{S}{V} + K_d(1-T) \frac{D}{V}$
20.9	$WACC = K_e \frac{S}{V} + K_p \frac{P}{V} + K_i \frac{D}{V}$, Where: $K_i = K_d(1-T)$
20.10	Market value: $S = P_0 \times n$
20.13	Net proceeds: $NP = \frac{I(1-T)}{K_i} \left[1 - \frac{1}{(1+K_i)^n} \right] + F \left(\frac{1}{(1+K_i)^n} \right)$
20.14	Cost of preferred shares: $K_p = \frac{D_p}{NP}$
20.17	$K_{ne} = \frac{D_1}{NP} + g$
20.21	$K_e = \frac{D_1}{P_0} + g = \frac{X_1(1-b)}{P_0} + b * ROE$
20.27	Cost of new equity: $K_{ne} = K_e * \frac{P_0}{NP}$