

PAST EXAM

Title: Corporate Finance_2022
Lecturer: Prof. Dr. Shushu Liao

Time: 10:00-12:00

SECTION A (30%)

Section A consists of 15 Multiple Choice Questions. Each question carries 2 marks.

1. You have just taken out a five-year loan from a bank to buy an engagement ring that costs 1000\$ with the annual interest rate of 3%. What is your monthly payment for each of the next five years?
 - A. 18.20\$
 - B. 17.97\$
 - C. 218.35\$
 - D. 230.97\$

Answer: B

2. You are saving a down payment for a house. You have now already saved 10,000 and plan to save 1,000 per year at the end of each year. If you earn 5% per year on your savings, how long will it take to save 100,000. Which is the excel formula to solve the above problem?
 - A. NPER(0.05,-1000,-10000,100000)
 - B. NPER(0.05,1000,-10000,100000)
 - C. NPER(0.05,1000,10000,100000)
 - D. None of the above

Answer: A

3. Suppose you begin saving for your retirement by depositing 1,000 per *quarter* in savings account. If the yearly interest rate is 20%, how much will you have in 5 years?
 - A. Around 33,066
 - B. Around 29,766
 - C. Around 34,719
 - D. None of the above

Answer: A

~~Suppose the following zero-coupon government bonds are trading at the prices per 1000\$ face value of:~~

Maturity	1-year bond	2-year bond
Price	\$966.2	\$876.0

~~Use the information to answer the questions 4 and 5.~~

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4. ~~What is the yield to maturity for the 1-year bond and 2-year bond?~~
~~A. 1-year bond: 3.50% — 2-year bond: 4.00%~~
~~B. 1-year bond: 3.50% — 2-year bond: 4.50%~~
~~C. 1-year bond: 3.50% — 2-year bond: 6.84%~~
~~D. None of the above~~
5. ~~What is the implied one-year forward rate based on the yields to maturity for the 1-year bond and 2-year bond?~~
~~A. 3.5%~~
~~B. 10.3%~~
~~C. 10.6%~~
~~D. None of the above~~
6. Which of the following is NOT an advantage of a sole proprietorship?
 A. Single taxation
 B. Ease of setup
 C. Limited liability
 D. No separation of ownership and control

Answer: C

7. Companies adjust their dividends policy since their investors' goals are to earn a substantial regular current income. This corporate policy can be theorized as
 A. Paying dividends as a way to reduce agency problems
 B. Clientele effects of dividends
 C. Signaling effects of dividends
 D. Tax consequences of dividend income

Answer: B

8. ~~A bond has the below characteristics. The price of the bond per 1,000 face value is closest to:~~

Coupon rate	8%
Coupon frequency	Semi-annual
Yield to maturity	6%
Maturity date	6 years remaining

- ~~A. 1119.37~~
~~B. 983.44~~
~~C. 1122.33~~
~~D. 1099.54~~

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9. ABC Inc. invested \$40m of property, plant and equipment last year. This year the investment project starts to generate sales. It produces sales revenues of \$135m (with no costs of goods sold) and net income of \$40m, and operating cash flows of \$54m, pay dividends of \$12m, have accounts receivables equivalent to 15% of sales, no inventory and the after-tax interest cost is \$5m during the year. What is the *total* free cash flow for ABC Inc.?
- A. 14 m
 - B. 19 m
 - C. 59 m
 - D. None of the above

Answer: B (FCF = CFO + after-tax interest – CAPEX = 54 + 5 -40 = 19)

10. Which of the following option positions is most likely to carry a loss when stock prices go down?
- A. Short a call
 - B. Long a put
 - C. Long a call
 - D. Short a stock

Answer: C

11. Alex Inc. is contemplating building a retail store across town. The company already owned a warehouse for the retail store which the company acquired three years ago for \$3 million. Which of the following is most likely to be considered as sunk costs?
- A. The value of warehouse if it's sold
 - B. The loss of sales in the existing retail outlet
 - C. The \$3 million acquisition costs of the warehouse
 - D. The expenditures on marketing and advertising for the retail store

Answer: C

- ~~12. Cran Co. has dividends per share of \$5 in the coming and decided to pay all earnings as dividends. The current share price is 40\$. If Cran Co. reduced the dividends payout ratio to 60%, what is the closet new share price if the return on new investment is expected to be 10%?~~
- ~~A. 40~~
 - ~~B. 35.29~~
 - ~~C. 58.82~~
 - ~~D. None of the above~~

13. Incremental IRR: Consider the following two mutually exclusive projects

	Project A	Project B
Year 0	-25000	-23500
Year 1	800	3000
Year 2	1600	2000

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Year 3	5500	500
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What is the Excel formula for the calculating the incremental IRR/cross-over rate that equates the value Project A to the value of Project B.

- A. IRR(-25000,800,1600,5500)
- B. IRR(-25000,800,1600,5500)-IRR(-23500,3000,2000,500)
- C. IRR(-23500,3000,2000,500)
- D. IRR(1500,2200,400,-5000)

Answer: D

14. Nelta Corp. has a total of 800\$ available to spend and has to choose from the following projects:

Project	NPV	Initial investment
A	120\$	50\$
B	500\$	350\$
C	1200\$	700\$
D	70\$	50\$

—What projects would Nelta Corp. choose:

- A. All of them
- B. Project A and C
- C. Project A and B and C
- D. Project A and C and D

Answer: D

15. Which of the following is correct about post earnings announcement drift?

- A. It represents a delayed response to earnings news.
- B. Stock prices incorporate all available public information.
- C. Arbitragers can earn abnormal returns by buying securities that are overpriced
- D. Investors are overreacting to negative earnings news.

SECTION B (70%)

Section B consists of 6 Questions. Show the steps or formula you use to solve problems.

Q1. Consider the following project:

Year	Cash flow
0	-28,000
1	12,500
2	18,700

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3	11,800
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- What is the NPV of this project if the discount rate is 10%? (3 marks)
- Use the method of Trial and Error to estimate the IRR of this project. Start with a guess of discount rate between 23% and 27%. (5 marks) Name one of the disadvantages of IRR over NPV. (1 mark)
- What is the payback period of the project? (2 marks)

Answers:

1) $NPV = -28,000 + 12,500/1.10 + 18,700/1.10^2 + 11,800/1.10^3$ $NPV = 7683.7$

2) $IRR(-28000, 12500, 18700, 11800)$

3) $(x-23\%)/(27\%-23\%) = (0-864.1)/(-802.82-864.1)$

$X=25.1\%$ 1.829 years

Q2. A company borrow \$6,000 4-year loan at 8% from a bank. What is the amortization schedule for a Fixed Payment Schedule? Show your interest payment and principal payment for each of the year. (10 marks)

Answers:

Fixed payment

All principal payment is the same

Fixed Payment Interest=Beg. Balance* rate Principal=Payment-Interest End. Balance=Beg.

Balance-Principal

Year	Beg. Balance	Periodic Payment	Interest Paid	Principal Paid	End. Balance
1	6000	1,811.52	480	1,331.525	4668.48
2	4668.48	1,811.52	373.48	1,438.047	3230.43
3	3230.43	1,811.52	258.43	1,553.091	1677.34
4	1677.34	1,811.52	134.19	1,677.338	0

Q3.

Quarters	Dividends	Price
2010Q4	0.13	28
2011Q1	0.00	28
2011Q2	0.10	30
2011Q3	0.12	31
2011Q4	0.16	31

- What are realized returns from 2011Q1 to 2011Q4? (4 marks)
- What is the annualized return for the year of 2011? (2 marks)
- ~~What is the average returns? (1 mark)~~

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Answer:

returns		Annualized return	Average
0	1		
0.075	1.075		
0.037333	1.037333		
0.005161	1.005161	$1.12089-1=12.089\%$	0.0294

Q4. You are considering an investment project with an estimated life of 2 years with following information:

Revenue Estimates Sales = 100 units/year Per Unit Price = \$130

The overhead expenses are estimated to be 300\$ during the project life. Cost Estimates Per Unit = \$50

Accounts Receivables is equal to 10% of sales and Accounts Payables is equal to 5% of costs of goods sold. Inventory is equal to 4% of sales.

Up-Front New Equipment = \$15,000; The Expected life of the new equipment is 3 years and straight-line depreciation method is used. The required rate of return is 12% and the corporate tax rate is 30%. Present the capital budgeting decision in a Table including the following information:

- What are the earnings before tax and interest (EBIT) for year 1 and year 2? (4 marks)
- What are the unlevered net income for year 1, 2, and 3? (3 marks)
- What are the free cash flows for year 0, 1, 2, and 3? (6 marks)
- What is the NPV of the project? (1 mark)

Answers:

NWC	1570	1570	0
	Year 0	Year 1	Year 2
Sales	13000	13000	
COGS	5000	5000	
Gross profit	8000	8000	
SGA	300	300	
Depreciation	5000	5000	5000
EBIT	2700	2700	-5000

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Tax	810	810	-1500
Unlevered net income	1890	1890	-3500
Capex	15000		
Depreciation	5000	5000	5000
Change in NWC	1570	0	-1570
FCF	-15000	5320	6890
		3070	

$$NPV = (\$2,572.17)$$

Q5. Equity valuation and costs of capital:

- a) ~~ABC Corp. has just paid a dividend of 1.0\$ per share. The dividend per share in the next two years are projected to 2\$ and 2.5\$. Afterwards, dividends are assumed to grow at a rate of 5%. Assume the required rate of return is 12%, what is the stock price of C Corp. (6 marks)~~
- b) Suppose the company X has an equity beta of 0.6 and the current risk-free rate is 5%. If the expected market risk premium is 8.0%, and the interest cost is 2%. The company is financed with 70% of debt and 30% of equity. If the tax rate is 30%, what is the risk-premium of company X and ~~what is the weighted average cost of capital of Company X?~~ (5 marks) What does a high equity beta tell us? (1 mark)

Answer b) :

Expected return of Company X is: $5\% + 8\% \times 0.6 = 9.8\%$

Risk premium of Company X is: $9.8\% - 5\% = 4.8\%$

High equity beta indicates that the stock has high market or systematic risk since its return is highly sensitive to the market return.

Q6. Discussions:

- a) ~~Explain what a premium bond is and what a junk bond is. (2 marks)~~
- b) ~~Briefly discuss who are more likely to benefit from interest rate hikes and who are more likely to suffer from it. (5 marks)~~
- c) ~~Based on the Gordon Dividend Growth Model, is it true that the growth rate of dividends is the same as the growth rate of stock prices? Please explain why. (4 marks)~~
- d) ~~What are the three forms of efficient market hypothesis? What are the definitions of those three forms of efficient market hypothesis? (5 marks)~~

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Formula Sheet of Excel:

Payment per period: PMT (rate,nper,pv,[fv],[type])

Present value: PV (rate, nper, pmt,[fv],[type])

Future value: FV (rate, nper, [pmt], [pv], [type])

Number of payment: NPER (rate, pmt, pv, [fv], [type])

Net Present Value: NPV (rate, value1, value 2,...)

Internal rate of return: IRR(value 1, value 2,..)