Finance and Financial Reporting

Master in Actuarial Science

Exam ER

07/02/2019

3 HOURS

Name: ______________________________ No. __________

PLEASE READ THE FOLLOWING INFORMATION BEFORE SOLVING THE EXAM:

1) You are allowed to keep your pens, pencils and a calculator with you as well as the current edition of the Formulae and Tables. The calculator cannot have neither communications nor any kind of texting features.
2) The structure of the exam is the following:
    - Questions 1 to 10 are multiple choice;
    - Questions 11 to 20 require explaining all the steps in your solutions.
3) You must not start writing your answers in the booklet until instructed to do so by the supervisor.
4) Mark allocations are shown in brackets.
5) Attempt all 20 questions. Answer questions 1-10 in the grid to answer multiple choice questions. Answer questions 11-20 in the space given below the question. If you eventually require more space, please, use the additional sheet at the end of this booklet.
6) Candidates should show calculations where this is appropriate.
7) **You are not allowed to un-staple the exam. However, you can detach the scrap paper.**

GOOD LUCK!

GRID TO ANSWER MULTIPLE CHOICE QUESTIONS

Question #	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

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1) [2 points] You overhear your manager saying that she plans to book an Ocean-view room on her upcoming trip to Miami for a meeting. You know that the interior rooms are much less expensive, but that your manager is traveling at the Company's expense. This use of additional funds comes about as a result of:

a) an agency problem
b) an adverse selection problem
c) a moral hazard
d) a publicity problem

2) [2 points] ECE's book value of equity is €100 million. If ECE's stock is currently trading at €24.00 and ECE has 25 million shares outstanding, then ECE's market-to-book ratio is closest to:

a) 0.24
b) 4
c) 6
d) 30

$$\frac{MV}{BV} = \frac{€24 \times 25,000,000}{100,000,000} = 6.0$$

3) [2 points] Which of the following statements regarding arbitrage and security prices is INCORRECT?

a) We call the price of a security in a normal market the no-arbitrage price for the security
b) In financial markets it is possible to sell a security you do not own by doing a short sale
c) When a bond is underpriced, the arbitrage strategy involves selling the bond and investing some of the proceeds
d) The general formula for the no-arbitrage price of a security is Price(security) = PV(All cash flows paid by the security)

4) [2 points] Which of the following statements is FALSE?

a) The principal or face value of a bond is the notional amount we use to compute the interest payments
b) Payments are made on bonds until a final repayment date, called the term date of the bond
c) The coupon rate of a bond is set by the issuer and stated on the bond certificate
d) The promised interest payments of a bond are called coupons

Use the following information to answer the question(s) below.

Sarah Palin reportedly was paid a $11 million advance to write her book Going Rogue. The book took one year to write. In the time she spent writing, Palin could have been paid to give speeches and appear on TV news as a political commentator. Given her popularity, assume that she could have earned $8 million over the year (paid at the end of the first year) she spent writing the book. Assume that she was unable to fulfill her media commitments of appearing on TV news as a political commentator or give speeches, while she was writing the book.

5) [2 points] The IRR of Palin's book deal is closest to:

a) -27.27%
b) -37.50%
c) 27.25%
d) 37.50%

$$0 = 11 - \frac{8}{1+IRR}$$
$$IRR = 0.2727$$

6) [2 points] Assume that once her book is finished, it is expected to generate royalties of $5 million in the first year (paid at the end of the year) and these royalties are expected to decrease by 40% per year in perpetuity. If Palin's cost of capital is 10% and given these royalties payments, the NPV of Palin's book deal is closest to:

a) $3.75 million
b) $12.20 million
c) $13.00 million
d) $13.73 million

$$NPV = 11 - \frac{8}{1.1} + \frac{5}{0.1-(-0.4)} = 13.73$$

7) [2 points] Anyone who purchases the stock on or after the ________ date will not receive the dividend

a) distribution
b) record
c) ex-dividend
d) payment

8) [2 points] Which of the following statements is FALSE?

a) A holder would not exercise an in-the-money option
b) The option seller, also called the option writer, sells (or writes) the option and has a short position in the contract
c) Because the long side has the option to exercise, the short side has an obligation to fulfill the contract
d) When the exercise price of an option is equal to the current price of the stock, the option is said to be at-the-money

9) [2 points] Which of the following statements is NOT true regarding venture capitalists?

a) They can provide substantial capital for young companies
b) They firms offer limited partners a number of advantages over investing directly in start-ups themselves as angel investors
c) They use their control to protect their investments, so they may therefore perform a key nurturing and monitoring role for the firm
d) They might invest for strategic objectives in addition to the desire for investment returns

10) [2 points] Hammond Motors had sales of €35 million in 2018 with a cost of goods sold of €20 million. A simplified balance sheet for Hammond appears below (amounts in € million):

Assets		**Liabilities and Equity**	
Cash	1.6	Accounts Payable	1.8
Accounts Receivable	4.2	Notes Payable	3.2
Inventory	3	Accruals	1.5
Current Assets	8.8	Total Current Liabilities	6.5
		Long-term Debt	4
Net Property, Plant and Equipment	8.2	Total Liabilities	10.5
		Stockholders' Equity	6.5
Total Assets	17	Total Liabilities and Stockholders' Equity	17

Hammond's cash conversion cycle in 2009 is closest to:

a) 22 days
b) 44 days
c) 58 days
d) 66 days

$$Accounts\ Receivable\ days = \frac{Accounts\ Receivables}{Average\ Daily\ \text{Sales}} = \frac{4.2}{35/365} = 43.8$$

$$Inventory\ Days = \frac{Inventory}{Average\ Daily\ COGS} = \frac{3}{20/365} = 54.75$$

$$Accounts\ Payable\ days = \frac{Accounts\ Payable}{Average\ Daily\ \text{COGS}} = \frac{1.8}{20/365} = 32.85$$

$$CCC = accounts\ receivables\ days + inventory\ days - accounts\ payable\ days$$
$$= 43.8 + 54.75 - 32.85 = 65.70$$

11) [5 points] Briefly explain the sequence of cash flows between financial markets and the firm.

- Cash is raised by selling financial assets to investors.
- Cash is invested in the firm's operation and used to purchase real assets.
- Cash is generated by the firm's operations.
- Cash is reinvested or returned to investors.

12) [5 points] What are some of the disadvantages of using the IRR method?

There are several disadvantages to the IRR method. It is not useful in evaluating mutually exclusive projects and dependent projects. You can also get multiple IRRS for projects having cash flows with more than one change in sign. Also, IRR cannot distinguish between borrowing and lending projects. In most cases it may be easier to use the NPV method.

13) [5 points] Briefly explain the difference between company and project cost of capital.

If a firm is considering projects that have the same risk as the firm, then the company cost of capital is the same as the project cost of capital. However, if the firm is considering projects that have risks different from the company, then the project cost of capital is a better risk estimate than the company cost of capital.

14) [5 points] Briefly explain the term qualified opinion issued by the auditors.

When independent auditors find problems associated with the accounting procedures or results of a firm, they issue a qualified opinion. A qualified opinion is bad news for the company as it suggests that the firm is not following proper accounting procedures.

15) [5 points] Explain the pecking order theory of capital structure.

This theory is based on the observation that, in general, managers know more about the firm's prospects, risks, and values than do outsiders. Their asymmetric information affects managers' choices between internal and external financing and between new issues of debt and equity. The key problem is the difficulty of selling securities to investors at a fair value. Investors infer—by the mere act of selling stock—that the stock must be overvalued. The implication is that firms prefer internal financing to external financing. When firms are propelled to go for external financing, they prefer debt to equity.

16) [5 points] Briefly describe a sale and lease-back arrangement.

As an example, a firm in need of cash may sell the office building it owns to a leasing company and simultaneously sign a long-term lease agreement for the use of the office building. This is called sale and lease-back arrangement. These transactions are common in real estate. The legal ownership of the office building is transferred to the leasing company, but the right to use it stays with the firm.

17) [5 points] Why is liquidity relevant?

Firms often have a need to convert assets into cash quickly. This is necessary to meet short-term obligations. Without liquidity, even short-term loans could force a company into financial distress.

18) [5 points] Discuss two important ways of speeding up collection.

First, many companies, in order to speed up collections, use concentration banking. In this case customers send payment to the nearest branch office. The local branch office then deposits the checks into a local bank account. Surplus funds are transferred to a concentration account at one of the company's principal banks. Second, the lockbox system is used for speeding up collection. The company rents a post office box in each region. Customers send their payments to the post office box. The local bank empties the box and deposits checks in the company's local account. Surplus funds are transferred to the company's principal banks.

Use the following information about NVIDIA for the last two exercises.

Balance Sheet	2014	2015	2016	2017
Non Current Assets	**1 626 183 000**	**1 488 071 000**	**1 317 000 000**	**1 305 000 000**
- Property and equipment, net*	582 740 000	557 282 000	466 000 000	521 000 000
- Goodwill*	643 179 000	618 179 000	618 000 000	618 000 000
- Intangible Assets, net*	296 012 000	221 714 000	166 000 000	104 000 000
- Other Assets	104 252 000	90 896 000	67 000 000	62 000 000
Current Assets	**5 624 711 000**	**5 713 297 000**	**6 053 000 000**	**8 536 000 000**
- Inventories*	387 765 000	482 893 000	418 000 000	794 000 000
- Prepaid expenses and other current assets	70 285 000	70 174 000	93 000 000	118 000 000
- Deferred income taxes	68 656 000	63 403 000	0	0
- Accounts receivable, less allowances	426 357 000	473 637 000	505 000 000	826 000 000
- Marketable Securities	3 520 223 000	4 126 685 000	4 441 000 000	5 032 000 000
- Cash and cash equivalents	1 151 425 000	496 505 000	596 000 000	1 766 000 000
Total assets	**7 250 894 000**	**7 201 368 000**	**7 370 000 000**	**9 841 000 000**
- Common stock*	732 000	754 000	1 000 000	1 000 000
- Additional paid-in capital	3 483 342 000	3 855 092 000	4 170 000 000	4 708 000 000
- Treasury stock	-2 537 295 000	-3 394 585 000	-4 048 000 000	-5 039 000 000
- Accumulated other comprehensive income	4 877 000	7 844 000	-4 000 000	-16 000 000
- Retained earnings	3 504 742 000	3 948 877 000	4 350 000 000	6 108 000 000
Shareholders' equity*	**4 456 398 000**	**4 417 982 000**	**4 469 000 000**	**5 762 000 000**
Non current liabilities	**1 849 000 000**	**1 887 356 000**	**550 000 000**	**2 291 000 000**
- Long-term debt	1 373 875 000	1 398 428 000	97 000 000	2 020 000 000
- Other long-term liabilities	475 125 000	488 928 000	453 000 000	271 000 000
Current liabilities	**945 496 000**	**896 030 000**	**2 351 000 000**	**1 788 000 000**
- Accounts payable	324 391 000	293 223 000	296 000 000	485 000 000
- Accrued and other current liabilities*	621 105 000	602 807 000	642 000 000	507 000 000
- Convertible short-term debt	0	0	1 413 000 000	796 000 000
Total liabilities	**2 794 496 000**	**2 783 386 000**	**2 901 000 000**	**4 079 000 000**
Total liabilities, convertible debt conversion obligation and shareholders' equity	**7 250 894 000**	**7 201 368 000**	**7 370 000 000**	**9 841 000 000**

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Income Statement	2014	2015	2016	2017
Revenue	**4 130 000 000**	**4 682 000 000**	**5 010 000 000**	**6 910 000 000**
Cost of revenue (Excluding D&A)	1 623 251 000	1 862 030 000	2 002 000 000	2 660 000 000
Gross Profit	**2 506 749 000**	**2 819 970 000**	**3 008 000 000**	**4 250 000 000**
Research and development	1 335 834 000	1 359 725 000	1 331 000 000	1 463 000 000
Sales, general and administrative	435 702 000	480 763 000	602 000 000	663 000 000
Restructuring and other charges	0	0	131 000 000	3 000 000
Total operating expenses	**1 771 536 000**	**1 840 488 000**	**2 064 000 000**	**2 129 000 000**
EBITDA	**735 213 000**	**979 482 000**	**944 000 000**	**2 121 000 000**
Depreciation and Amortization	239 148 000	220 000 000	197 000 000	187 000 000
EBIT	**496 065 000**	**759 482 000**	**747 000 000**	**1 934 000 000**
Interest expenses	10 443 000	46 133 000	47 000 000	58 000 000
Interest income	17 119 000	28 090 000	39 000 000	54 000 000
Other income (expense), net	7 351 000	13 890 000	4 000 000	-25 000 000
Income before income tax	**510 092 000**	**755 329 000**	**743 000 000**	**1 905 000 000**
Income tax expense	70 264 000	124 249 000	129 000 000	239 000 000
Implicit marginal tax rate (t)		*22%*	*39%*	*9%*
Net income	**439 828 000,00**	**631 080 000,00**	**614 000 000,00**	**1 666 000 000,00**

Peers' Selected Ratios for 2017	AMD	Intel Corporation	Xilinx, Inc	Broadcom Ltd.	Texas Instruments Incorporated	Peers avarage
EBIT Interest Coverafe Ratio	1,58	32,47	-0,06	-0,01	78,74	22,54
Operating Margin	35,30%	33,46%	31,36%	12,92%	41,16%	30,84%
Net Profit Margin	34,75%	512,44%	-1,31%	-0,15%	1945,22%	459,54%
Asset Turnover	0,16	0,53	0,52	0,34	0,88	0,49
Equity Multiplier	6,68	1,73	2,02	2,66	1,64	2,95
ROE	35,98%	469,85%	-1,37%	-0,14%	2807,33%	656,59%

19) [20 points] Imagine that you have been asked to perform a financial statement analysis to NVIDIA. For this end, you divided your report in two sections. In part a) you present some ratios for the period under analysis. In part b) you comment your results.

a) [12 points] For NVIDIA, calculate the Interest Coverate Ratio, Operating Margin, Net Profit Margin, Asset Turnover, Equity Multiplier and ROE.

[Solution]

NVIDIA	2014	2015	2016	2017
EBIT Interest Coverafe Ratio	47,50	16,46	15,89	33,34
Operating Margin	12,0%	16,2%	14,9%	28,0%
Net Profit Margin	10,6%	13,5%	12,3%	24,1%
Asset Turnover	0,57	0,65	0,68	0,70
Equity Multiplier	1,63	1,63	1,65	1,71
ROE	9,87%	14,28%	13,74%	28,91%

b) [8 points] Comment your results from part a).

[Solution]

During this period, NVIDIA improved their financial and economic situation. All ratios show better performance in 2017 than in 2014, with the exception of the Interest Coverage Ratio (ICR), which has decrease. This trend goes in hand with an increase in the debt level, as the higher equity multiplier shows. Nevertheless, from 2015, the ICR is sustainably growing due to a strong growth of EBIT. The operating and Net Profit margins increased significantly during these years, showing a better control of costs. Both asset turnover and equity multiplier had low growth rates, implying low gains of efficiency and a small increase in debt, given the size of the company.

When compared with its peers, NVIDIA has a higher ICR as well as less debt as a proportion of the equity. It also has higher asset turnover, implying higher efficiency. However, the company has lower profitability in average than their peers. Nevertheless, it is important to stress that operating margin is pretty much in line with its peers, but the net profit margin (NPM) is not. Eventually, because the volatility of the peers' NPM is very high, ranging from -1.31% to 1945.22%. Most likely, NPM from the peers was affected by non-recurrent events. If this is case, comparing NVIDIA's NPM with its peers is meaningless.

20) [20 points] NVIDIA's auditing team reported that the following facts were not reflected in the books Do the necessary corrections to the:

a) Statement of Profit or Loss (income statement) [10 points]

b) Statement of Financial Position (balance sheet) [10 points]

Facts not written in the books in 2017 (€):

1. Sales revenue: 1 250 000 (of which 350 000 will be received from customers during 2018).
2. Cost of Sales: 750 000.
3. Purchases (inventory): 560 000 (to be paid in 2018).
4. Construction costs: 100 000 (entirely paid in 2017).
5. Consultancy fees: 2 000 000 (entirely paid in 2017).
6. Remunerations and social charges: 600 000 (entirely paid in 2017).
7. Repayment of financial long-term debt for 150 000 (entirely paid in 2017).
8. Acquisition of intangible assets for 5 000 000 (entirely paid in 2017).
9. Annual insurance payment at 01/11/2017: 240 000
10. Special dividend payment at 15/12/2017: 40 000 000.

[Solution]

a) Statement of Profit or Loss (income statement) [10 points]

Income Statement	2017	2017 Revised
Revenue	**6 910 000 000**	**6 911 250 000**
Cost of revenue (Excluding D&A)	2 660 000 000	2 660 750 000
Gross Profit	**4 250 000 000**	**4 250 500 000**
Research and development	1 463 000 000	1 463 000 000
Sales, general and administrative	663 000 000	665 740 000
Restructuring and other charges	3 000 000	3 000 000
Total operating expenses	**2 129 000 000**	**2 131 740 000**
EBITDA	**2 121 000 000**	**2 118 760 000**
Depreciation and Amortization	187 000 000	187 000 000
EBIT	**1 934 000 000**	**1 931 760 000**
Interest expenses	58 000 000	58 000 000
Interest income	54 000 000	54 000 000
Other income (expense), net	-25 000 000	-25 000 000
Income before income tax	**1 905 000 000**	**1 902 760 000**
Income tax expense	239 000 000	180 123 580
Tax rate (t)	***9,47%***	***9,47%***
Net income	**1 666 000 000**	**1 722 636 420**

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b) Statement of Financial Position (balance sheet) [10 points]

Balance Sheet	2017	2017 Revised
Non Current Assets	**1 305 000 000**	**1 310 000 000**
- Property and equipment, net	521 000 000	521 000 000
- Goodwill	618 000 000	618 000 000
- Intangible Assets, net	104 000 000	109 000 000
- Other Assets	62 000 000	62 000 000
Current Assets	**8 536 000 000**	**8 489 170 000**
- Inventories	794 000 000	793 810 000
- Prepaid expenses and other current assets	118 000 000	118 000 000
- Deferred income taxes	0	0
- Accounts receivable, less allowances	826 000 000	826 550 000
- Marketable Securities	5 032 000 000	5 032 000 000
- Cash and cash equivalents	1 766 000 000	1 718 810 000
Total assets	**9 841 000 000**	**9 799 170 000**
- Common stock	1 000 000	1 000 000
- Additional paid-in capital	4 708 000 000	4 708 000 000
- Treasury stock	-5 039 000 000	-5 039 000 000
- Accumulated other comprehensive income	-16 000 000	-16 000 000
- Retained earnings including net income	6 108 000 000	6 124 636 420
Shareholders' equity	**5 762 000 000**	**5 778 636 420**
Non current liabilities	**2 291 000 000**	**2 290 850 000**
- Long-term debt	2 020 000 000	2 019 850 000
- Other long-term liabilities	271 000 000	271 000 000
Current liabilities	**1 788 000 000**	**1 729 683 580**
- Accounts payable	485 000 000	485 560 000
- Accrued and other current liabilities	507 000 000	448 123 580
- Convertible short-term debt	796 000 000	796 000 000
Total liabilities	**4 079 000 000**	**4 020 533 580**
Total liabilities, convertible debt conversion obligation and shareholders' equity	**9 841 000 000**	**9 799 170 000**