King Saud University

Department of Mathematics

First Trimester 1444 H

Midterm Exam

Actuarial Corporate Finance

ACTU 262, Duration:2 Hours

Name: MODEL ANSWER
Sequence Number:
Section:
Date: 6/10/2022

Note: The exam consists of 4 pages

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Exercise 1 (MCQ)

1) **Which of the following could explain why a business might choose to organize as a corporation rather than as a sole proprietorship or a partnership?**
   a) Corporations generally face fewer regulations.
   b) Corporations generally face lower taxes.
   c) Corporations generally find it easier to raise capital.
   d) Corporations enjoy unlimited liability.
   e) Statements c and d are correct.

2) **The primary goal of the financial management is ____________**
   a) to maximize the return.
   b) to minimize the risk.
   c) to maximize the wealth of owners.
   d) To maximize profit.

3) **Capital budgeting is related to ____________**
   a) long terms assets.
   b) short term assets.
   c) long terms and short terms assets.
   d) fixed assets.

4) **A ratio that compares investors' and creditors' stake in a company.**
   a) Debt ratio.
   b) Debt-Equity ratio.
   c) Equity ratio.
   d) Investor creditor ratio.

5) **The best ratio to evaluate short-term liquidity is:**
   a) Current ration.
   b) Working capital.
   c) Cash ratio.
   d) Debt to asset ratio.

6) **The DuPont Analysis uses the following ratios except:**
   a) Debt ratio.
   b) Profit margin.
   c) Total asset turnover.
   d) Financial leverage.

7) **The equity multiplier helps creditors:**
   a) Evaluate future earnings.
   b) Evaluate company cashflows.
   c) Evaluate company profitability.
   d) Evaluate company lending risk.

Use the following information to answer items 8 - 10:

At December 31 a company's records show the following information:

Cash	$ 10,000
Accounts Receivable	30,000
Inventory	80,000
Prepaid Insurance	6,000
Long-term Assets	200,000
Accounts Payable	30,000
Notes Payable due in 10 months	25,000
Wages Payable	5,000
Long-term Liabilities	70,000
Stockholders' (Owner's) Equity	196,000

8) **The company's working capital is:**
   a) 60,000
   b) 66,000
   c) 196,000

9) **The company's current ratio is:**
   a) 1.0:1
   b) 2.0:1
   c) 2.1:1

10) **The company's quick ratio is:**
   a) 1.0:1
   b) 2.0:1
   c) 0.7:1

Exercise 2.[4]

1) Firm A and firm B have debt–total asset ratios of 35% and 30% and returns on total assets of 12% and 11%, respectively. Which firm has a greater return on equity
2) Sherwood Inc.'s net income for the most recent year was $13,168. The tax rate was 34 percent. The firm paid $3,605 in total interest expense and deducted $2,382 in depreciation expense. What was the cash coverage ratio for the year?

3) Holliman Corp. has current liabilities of $365,000, a quick ratio of .85, inventory turnover of 5.8, and a current ratio of 1.4. What is the cost of goods sold for the company?

Answer:

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1) Debt-Total Asset ratio= 0.35=Total Debt/Total Asset = 1- Equity/Total Asset
Therefor Equity/Total Asset = 1-0.35 = 0.65
Return on Total Asset = Net Income / Total Asset = 0.12. Hence
ROE (A) = Net Income/ Equity = (Net Income/ Total Asset)/ (Equity/Total Asset) = 0.12/0.65=0.185. With the same argument for Firm B, we obtain ROE(B) = 0.11/0.70 = 0.157 l
Conclusion ROE (B) < ROE (A)

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2) Cash coverage ratio= (EBIT + depreciation)/ interest
EBIT? We find first Taxable Income:
Taxable Income – Tax rate (Taxable Income) =Net Income, therefore
Taxable Income (1-tax rate)=Net Income, then Taxable Income = Net Income / (1- tax rate)
Hence : Taxable Income = 19951.51 and Consequently Tax= 19951.51 x 0.34 = 6783.52
We deduce EBIT = Net Income + Tax + Interest = 23556.52
Conclusion Cash Coverage Ratio = 23556.52+2382/3605 = 7.195

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3) Quick ratio=current asset – inventory / current liabilities = 0.85
Inventory Turnover = Cost of goods / Inventory = 5.8
Current ratio= Current Asset/Current Liabilities = 1.4, therefore:
Current Assets = 1.4 x Current liabilities = 511000
Then: Quick Ratio = 0.85 = (511000 – Inventory) / Current Liabilities
which implies that:
Inventory = 511000 – Quick Ratio x Current Liabilities
= 511,000 – (0.85 x 365,000) = 200750
We conclude that Costs of Goods = 5.8 x Inventory = 5.8 x 200750 = 1,164,350

Excircies 3 [4]

Ritter Corporation's accountants prepared the following financial statements for year-end 2019:

RITTER CORPORATION
Income Statement 2019

Revenue	$797
Expenses	576
Depreciation	92
Net income	$129
Dividends	$ 97

RITTER CORPORATION
Balance Sheet December 31

	2018	2019
Assets		
Cash	$ 63	$ 84
Other current assets	175	192
Net fixed assets	398	417
Total assets	$636	$693
Liabilities and Equity		
Accounts payable	$ 129	$ 146
Long-term debt	155	163
Stockholders' equity	352	384
Total liabilities and equity	$636	$693

a) Determine the change in net working capital in 2019.
b) Determine the cash flow generated by the firm's assets during 2019.

Answer:

b. Change in NWC $= NWC_{end} - NWC_{beg}$
$= (CA_{end} - CL_{end}) - (CA_{beg} - CL_{beg})$
$= [(\$84 + 192) - 146] - [(\$63 + 175) - 129)$
$= \$130 - 109$
$= \$21$

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c. To find the cash flow generated by the firm's assets, we need the operating cash flow and the capital spending. So, calculating each of these, we find:

Operating cash flow	
Net income	$129
Depreciation	92
Operating cash flow	$221

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Note that we can calculate OCF in this manner since there are no taxes.

Capital spending	
Ending fixed assets	$417
Beginning fixed assets	–398
Depreciation	92
Capital spending	$111

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Now we can calculate the cash flow generated by the firm's assets, which is:

Cash flow from assets	
Operating cash flow	$221
Capital spending	–111
Change in NWC	–21
Cash flow from assets	$ 89

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Exercise 4 (6)

Use the following financial statements of Moose Tours, Inc.

MOOSE TOURS, INC. 2008 Income Statement		
Sales		$929,000
Costs		723,000
Other expenses		19,000
Earnings before interest and taxes		$187,000
Interest paid		14,000
Taxable income		$173,000
Taxes		60,550
Net income		$112,450
Dividends	$33,735	
Addition to retained earnings	78,715	

MOOSE TOURS, INC. Balance Sheet as of December 31, 2008			
Assets		**Liabilities and Owners' Equity**	
Current assets		Current liabilities	
Cash	$ 25,300	Accounts payable	$ 68,000
Accounts receivable	40,700	Notes payable	17,000
Inventory	86,900	Total	$ 85,000
Total	$152,900	Long-term debt	$158,000
Fixed assets		Owners' equity	
Net plant and equipment	413,000	Common stock and paid-in surplus	$140,000
		Retained earnings	182,900
		Total	$322,900
Total assets	$565,900	Total liabilities and owners' equity	$565,900

To calculate and interpret the following ratio:

a) Times interest earned ratio: EBIT/Interest = 187000/14000= 13.36 Times 0.5
The interest bills are covered 13.36 times 0.5

b) Cash coverage ratio = EBIT+ Depreciation /interest= 13.36 Times 0.5
Without considering depreciation, the interest bills are covered 13.36 times 0.5

c) Inventory turnover = Cost of Goods sold/Inventory = 8.53 Times 0.5
This company sold off or turned over the entire inventory 8.53 times. 0.5

d) Receivables turnover= sales/account receivable=22.83 Times 0.5
This company collected its outstanding credit accounts and reloaded the money 22.83 times during the year. 0.5

e) Total asset turnover = Sales/Total Assets= 1.64 Times 0.5
For every dollar in assets, this company generated $1.64 in sales. 0.5

f) Profit margin=Net Income/Sales=12% 0.5
The company generates 12 cents in profit for every dollar in sales 0.5

g) ROA=Net Income/Total Asset=19.87% 0.5
This company generates 19.87 cents profit per dollar of assets. 0.5

h) ROE=net income/total equity=34.8%
For every dollar in equity, this company generated near 34 cents in profit. 0.5

Exercise 5. [6]

We are given the following information about Scott, Inc.:

SCOTT, INC. 2019 Income Statement		
Sales		$891,600
Costs		727,900
Other expenses		18,240
Earnings before interest and taxes		$145,460
Interest expense		13,400
Taxable income		$132,060
Taxes (22%)		29,053
Net income		$103,007
Dividends	$36,224	
Addition to retained earnings	66,783	

SCOTT, INC.
Balance Sheet as of December 31, 2019

Assets		Liabilities and Owners' Equity	
Current assets		Current liabilities	
Cash	$ 24,280	Accounts payable	$ 65,200
Accounts receivable	37,070	Notes payable	16,320
Inventory	83,400	Total	$ 81,520
Total	$144,750	Long-term debt	$155,000
		Owners' equity	
Fixed assets		Common stock and paid-in	$130,000
Net plant and equipment	$396,500	surplus	174,730
		Retained earnings	$304,730
Total assets	$541,250	Total	$541,250
		Total liabilities and owners' equity	

a) Sales for 2020 are projected to grow by 20 percent. Interest expense will remain constant; the tax rate and the dividend payout rate also will remain constant. Costs, other expenses, current assets, fixed assets, and accounts payable increase spontaneously with sales. If the firm is operating at full capacity and no new debt or equity is issued, what external financing is needed to support the 20 percent growth rate in sales?
b) Suppose that the firm was operating at only 80 percent capacity in 2019. What is EFN now?
c) Suppose the firm wishes to keep its debt-equity ratio constant. What is EFN now?

Answer:

Assuming costs vary with sales and a 20 percent increase in sales, the pro forma income statement will look like this:

Pro Forma Income Statement

Sales	$ 1,069,920
Costs	873,480
Other expenses	21,888
EBIT	$ 174,552
Interest	13,400
Taxable income	$ 161,152
Taxes (22%)	35,453
Net income	$ 125,699

The payout ratio is constant, so the dividends paid this year is the payout ratio from last year times net income, or:

Dividends = ($36,224/$103,007)($125,699)
Dividends = $44,204

And the addition to retained earnings will be:

Addition to retained earnings = $125,699 – 44,204
Addition to retained earnings = $81,495

The new retained earnings on the pro forma balance sheet will be:

New retained earnings = $174,730 + 81,495
New retained earnings = $256,225

The pro forma balance sheet will look like this:

Pro Forma Balance Sheet

Assets			Liabilities and Owners' Equity		
Current assets			Current liabilities		
Cash	$	29,136	Accounts payable	$	78,240
Accounts receivable		44,484	Notes payable		16,320
Inventory		100,080	Total	$	94,560
Total	$	173,700	Long-term debt		155,000
Fixed assets					
Net plant and equipment		475,800	Owners' equity		
			Common stock and paid-in surplus	$	130,000
			Retained earnings		256,225
			Total	$	386,225
Total assets	$	649,500	Total liabilities and owners' equity	$	635,785

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So the EFN is:

EFN = Total assets – Total liabilities and equity
EFN = $649,500 – 635,785
EFN = $13,715

B)

Full Capacity = 891,600 / 0.8 = 1,114,500 which is greater than projected sales 1,096,000.

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In a) we assume it would necessary to add 79,300 in fixed asset. As a result, our original estimate of 13,715 in EFN is too high and consequently, no spending on net fixed asset is needed.

We need only 13,715 – 79,300 = -65,585 Surplus.

C) To maintain the debt-equity ratio constant, we use the sustainable growth rate:

Sustainable Growth Rate = $\frac{ROE \times b}{1 - ROE \times b}$

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ROE = 103,007/304,730 = 0.338 = 0.338
b = 66,783/ 103,007 = 0.648
We deduce the SGR = 28%

By increasing the sales by 28%, we obtain

Proforma Income statement

Sales	1, 141, 248
Costs	937,711
Other expenses	23, 347
EBIT	180, 190
Interest	17,151
Taxable Income	163,039
Taxes	35,868
Net Income	**127,171**
Dividend	**44,721**
Addition to retained Earinigs	**82,450**

Pro Forma Balance Sheet

Pro Forma Balance Sheet SCOTT, INC.			
Assets		**Liabilities**	
Current Assets		**Current Liabilities**	
Cash	31,078.40	Accounts Payable	83, 456
Accounts Receivable	47,449.60	Notes Payable	16,320
Inventory	106,752		
Total	185,280	**Total**	99,776
Net Fixed Assets		Long Term Debt	155,000
Net Plants and Equipment	505,520	Owners Equity	
		Common Stock and paid-in surplus	130,000 174,730
		Retained Earnings	387,180
Total Assets	690,800	Total	641,956
		EFN	48,844