FINM3093 Investments

Lecture 7 Exercises

1. General Weedkillers dominates the chemical weed control market with its patented product Weed-ex. The patent is about to expire, however. What are your forecasts for changes in the industry? Specifically, what will happen to industry prices, sales, the profit prospects of General Weedkillers, and the profit prospects of its competitors? What stage of the industry life cycle do you think is relevant for the analysis of this market?

2. Your business plan for your proposed start-up firm envisions first-year revenues of $120,000, fixed costs of $30,000, and variable costs equal to one-third of revenue.
   a. What are expected profits based on these expectations?
   b. What is the degree of operating leverage based on the estimate of fixed costs and expected profits?
   c. If sales are 10% below expectation, what will be the decrease in profits?
   d. Show that the percentage decrease in profits equals DOL times the 10% drop in sales.
   e. Based on the DOL, what is the largest percentage shortfall in sales relative to original expectations that the firm can sustain before profits turn negative?
   f. What are break-even sales at this point?
   g. Confirm that your answer to (f) is correct by calculating profits at the break-even level of sales.

3. As a securities analyst, you have been asked to review a valuation of a closely held business, Wigwam Autoparts Heaven, Inc. (WAH), prepared by the Red Rocks Group (RRG). You are to give an opinion on the valuation and to support your opinion by analyzing each part of the valuation. WAH's sole business is automotive parts retailing. The RRG valuation includes a section called "Analysis of the Retail Autoparts Industry," based completely on the data in the following table and the following additional information:
   - WAH and its principal competitors each operated more than 150 stores at year-end 2019.
   - The average number of stores operated per company engaged in the retail autoparts industry is 5.3.
   - The major customer base for autoparts sold in retail stores consists of young owners of old vehicles. These owners do their own automotive maintenance out of economic

necessity.

a. One of RRG's conclusions is that the retail autoparts industry as a whole is in the maturity stage of the industry life cycle. Discuss three relevant items of data from the table that support this conclusion.

b. Another RRG conclusion is that WAH and its principal competitors are in the consolidation stage of their life cycle.

   i. Cite three relevant items of data from Table 1 that support this conclusion.

   ii. Explain how WAH and its principal competitors can be in a consolidation stage while their industry as a whole is in the maturity stage.

	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Population 18–29 years old (percentage change)	−1.8%	−2.0%	−2.1%	−1.4%	−0.8%	−0.9%	−1.1%	−0.9%	−0.7%	−0.3%
Number of households with income more than $35,000 (percentage change)	6.0%	4.0%	8.0%	4.5%	2.7%	3.1%	1.6%	3.6%	4.2%	2.2%
Number of households with income less than $35,000 (percentage change)	3.0%	−1.0%	4.9%	2.3%	−1.4%	2.5%	1.4%	−1.3%	0.6%	0.1%
Number of cars 5–15 years old (percentage change)	0.9%	−1.3%	−6.0%	1.9%	3.3%	2.4%	−2.3%	−2.2%	−8.0%	1.6%
Automotive aftermarket industry retail sales (percentage change)	5.7%	1.9%	3.1%	3.7%	4.3%	2.6%	1.3%	0.2%	3.7%	2.4%
Consumer expenditures on automotive parts and accessories (percentage change)	2.4%	1.8%	2.1%	6.5%	3.6%	9.2%	1.3%	6.2%	6.7%	6.5%
Sales growth of retail autoparts companies with 100 or more stores	17.0%	16.0%	16.5%	14.0%	15.5%	16.8%	12.0%	15.7%	19.0%	16.0%
Market share of retail autoparts companies with 100 or more stores	19.0%	18.5%	18.3%	18.1%	17.0%	17.2%	17.0%	16.9%	15.0%	14.0%
Average operating margin of retail autoparts companies with 100 or more stores	12.0%	11.8%	11.2%	11.5%	10.6%	10.6%	10.0%	10.4%	9.8%	9.0%
Average operating margin of all retail autoparts companies	5.5%	5.7%	5.6%	5.8%	6.0%	6.5%	7.0%	7.2%	7.1%	7.2%

4. The market consensus is that Analog Electronic Corporation has an ROE = 9%, a beta of 1.25, and plans to maintain indefinitely its traditional plowback ratio of 2/3. This year's earnings were $3 per share. The annual dividend was just paid. The consensus estimate of the coming year's market return is 14%, and T-bills currently offer a 6% return.

   a. Find the price at which Analog stock should sell.

   b. Calculate the P/E ratio.

   c. Calculate the present value of growth opportunities.

d. Suppose your research convinces you Analog will announce momentarily that it will immediately reduce its plowback ratio to 1/3. Find the intrinsic value of the stock.
e. The market is still unaware of this decision. Explain why V_0 no longer equals P_0 and why V_0 is greater or less than P_0.

5. The stock of Nogro Corporation is currently selling for \$10 per share. Earnings per share in the coming year are expected to be \$2. The company has a policy of paying out 50% of its earnings each year in dividends. The rest is retained and invested in projects that earn a 20% rate of return per year. This situation is expected to continue indefinitely.
   a. Assuming the current market price of the stock reflects its intrinsic value as computed using the constant-growth DDM, what rate of return do Nogro's investors require?
   b. By how much does its value exceed what is would be if all earnings were paid as dividends and nothing were reinvested?
   c. If Nogro were to cut its dividend payout ratio to 25%, what would happen to its stock price?
   d. What if Nogro eliminated the dividend?

6. The Digital Electronic Quotation System (DEQS) Corporation pays no cash dividends currently and is not expected to for the next five years. The latest EPS was \$10, all of which was reinvested in the company. The firm's expected ROE for the next five years is 20% per year, and during this time it is expected to continue to reinvest all of its earnings. Starting in year 6, the firm's ROE on new investments is expected to fall to 15%, and the company is expected to start paying out 40% of its earnings in cash dividends, which it will continue to do forever after. DEQS's market capitalization rate is 15% per year.
   a. What is your estimate of DEQS's intrinsic value per share?
   b. Assuming its current market price is equal to its intrinsic value, what do you expect to happen to its price over the next year?
   c. What do you expect to happen to price in the following year?
   d. What effect would it have on your estimate of DEQS's intrinsic value if you expected DEQS to pay out only 20% of earnings starting in year 6?

7. Peninsular Research is initiating coverage of a mature manufacturing industry. John Jones, CFA, head of the research department, gathered the following fundamental industry and market data to help in his analysis:

Forecast industry earnings retention rate	40%
Forecast industry return on equity	25%
Industry beta	1.2
Government bond yield	6%
Equity risk premium	5%

a. Compute the price-to-earnings (P_0/E_1) ratio for the industry based on this fundamental data.

b. Jones wants to analyze how fundamental P/E ratios might differ among countries. He gathered the following economic and market data:

Fundamental Factors	Country A	Country B
Forecast growth in real GDP	5%	2%
Government bond yield	10%	6%
Equity risk premium	5%	4%

Determine whether each of these fundamental factors would cause P/E ratios to be generally higher for Country A or Country B.

8. Use the financial statements of Heifer Sports Inc. in the following table to find the information for Heifer's:
   a. Inventory turnover ratio in 2020.
   b. Debt/equity ratio in 2020.
   c. Cash flow from operating activities in 2020.
   d. Average collection period.
   e. Asset turnover ratio.
   f. Interest coverage ratio (EBIT/Interest expense)
   g. Operating profit margin.
   h. Return on equity.
   i. P/E ratio
   j. Compound leverage ratio.
   k. Net cash provided by operating activities.

Income Statement	2020	
Sales	$5,500,000	
Cost of goods sold	2,850,000	
Depreciation	280,000	
Selling and administrative expenses	1,500,000	
EBIT	$ 870,000	
Interest expense	130,000	
Taxable income	$ 740,000	
Taxes	330,000	
Net income	$ 410,000	
Balance Sheet, Year-End	**2020**	**2019**
Assets		
Cash	$ 50,000	$ 40,000
Accounts receivable	660,000	690,000
Inventory	490,000	480,000
Total current assets	$1,200,000	$1,210,000
Fixed assets	3,100,000	2,800,000
Total assets	$4,300,000	$4,010,000
Liabilities and shareholders' equity		
Accounts payable	$ 340,000	$ 450,000
Short-term debt	480,000	550,000
Total current liabilities	$ 820,000	$1,000,000
Long-term bonds	2,520,000	2,200,000
Total liabilities	$3,340,000	$3,200,000
Common stock	$ 310,000	$ 310,000
Retained earnings	650,000	500,000
Total shareholders' equity	$ 960,000	$ 810,000
Total liabilities and shareholders' equity	$4,300,000	$4,010,000

9. Use the following data to solve this problem.

Cash payments for interest	$(12)
Retirement of common stock	(32)
Cash payments to merchandise suppliers	(85)
Purchase of land	(8)
Sale of equipment	30
Payments of dividends	(37)
Cash payment for salaries	(35)
Cash collection from customers	260

Purchase of equipment	(40)

a. What are cash flows from operating activities?
b. What are cash flows from investing activities?
c. What are cash flows from financing activities?

10. Janet Ludlow is a recently hired analyst. After describing the electric toothbrush industry, her first report focuses on two companies, QuickBrush Company and SmileWhite Corporation, and concludes:

    QuickBrush is a more profitable company than SmileWhite, as indicated by the 40% sales growth and substantially higher margins it has produced over the last few years. SmileWhite's sales and earnings are growing at a 10% rate and produce much lower margins. We do not think SmileWhite is capable of growing faster than its recent growth rate of 10%, whereas QuickBrush can sustain a 30% long-term growth rate.

    a. Criticize Ludlow's analysis and conclusion that QuickBrush is more profitable, as defined by return on equity (ROE), than SmileWhite and that it has a higher sustainable growth rate. Use only the information provided in the following two tables. Support your criticism by calculating and analyzing:
        i. The five components that determine ROE.
        ii. The two ratios that determine sustainable growth: ROE and plowback.
    b. Explain how QuickBrush has produced an average annual earnings per share (EPS) growth rate of 40% over the last two years with an ROE that has been declining. Use only the information provided in Table 1.

Income Statement	December 2018	December 2019	December 2020	
Revenue	$3,480	$5,400	$7,760	
Cost of goods sold	2,700	4,270	6,050	
Selling, general, and administrative expense	500	690	1,000	
Depreciation and amortization	30	40	50	
Operating income (EBIT)	$ 250	$ 400	$ 660	
Interest expense	0	0	0	
Income before taxes	$ 250	$ 400	$ 660	
Income taxes	60	110	215	
Income after taxes	$ 190	$ 290	$ 445	
Diluted EPS	$ 0.60	$ 0.84	$ 1.18	
Average shares outstanding (000)	317	346	376	
Financial Statistics	**December 2018**	**December 2019**	**December 2020**	**3-Year Average**
COGS as % of sales	77.59%	79.07%	77.96%	78.24%
General and administrative as % of sales	14.37	12.78	12.89	13.16
Operating margin	7.18	7.41	8.51	
Pretax income/EBIT	100.00	100.00	100.00	
Tax rate	24.00	27.50	32.58	
Balance Sheet	**December 2018**	**December 2019**	**December 2020**	
Cash and cash equivalents	$ 460	$ 50	$ 480	
Accounts receivable	540	720	950	
Inventories	300	430	590	
Net property, plant, and equipment	760	1,830	3,450	
Total assets	$2,060	$3,030	$5,470	
Current liabilities	$ 860	$1,110	$1,750	
Total liabilities	$ 860	$1,110	$1,750	
Stockholders' equity	1,200	1,920	3,720	
Total liabilities and equity	$2,060	$3,030	$5,470	
Market price per share	$21.00	$30.00	$45.00	
Book value per share	$ 3.79	$ 5.55	$ 9.89	
Annual dividend per share	$ 0.00	$ 0.00	$ 0.00	

Table 1 QuickBrush Company financial statements: yearly data ($000 except per-share data)

Income Statement	December 2018	December 2019	December 2020	
Revenue	$104,000	$110,400	$119,200	
Cost of goods sold	72,800	75,100	79,300	
Selling, general, and administrative expense	20,300	22,800	23,900	
Depreciation and amortization	4,200	5,600	8,300	
Operating income	$ 6,700	$ 6,900	$ 7,700	
Interest expense	600	350	350	
Income before taxes	$ 6,100	$ 6,550	$ 7,350	
Income taxes	2,100	2,200	2,500	
Income after taxes	$ 4,000	$ 4,350	$ 4,850	
Diluted EPS	$ 2.16	$ 2.35	$ 2.62	
Average shares outstanding (000)	1,850	1,850	1,850	
Financial Statistics	**December 2018**	**December 2019**	**December 2020**	**3-Year Average**
COGS as % of sales	70.00%	68.00%	66.53%	68.10%
General and administrative as % of sales	19.52	20.64	20.05	20.08
Operating margin	6.44	6.25	6.46	
Pretax income/EBIT	91.04	94.93	95.45	
Tax rate	34.43	33.59	34.01	
Balance Sheet	**December 2018**	**December 2019**	**December 2020**	
Cash and cash equivalents	$ 7,900	$ 3,300	$ 1,700	
Accounts receivable	7,500	8,000	9,000	
Inventories	6,300	6,300	5,900	
Net property, plant, and equipment	12,000	14,500	17,000	
Total assets	$ 33,700	$ 32,100	$ 33,600	
Current liabilities	$ 6,200	$ 7,800	$ 6,600	
Long-term debt	9,000	4,300	4,300	
Total liabilities	$ 15,200	$ 12,100	$ 10,900	
Stockholders' equity	18,500	20,000	22,700	
Total liabilities and equity	$ 33,700	$ 32,100	$ 33,600	
Market price per share	$ 23.00	$ 26.00	$ 30.00	
Book value per share	$ 10.00	$ 10.81	$ 12.27	
Annual dividend per share	$ 1.42	$ 1.53	$ 1.72	

Table 2 SmileWhite Corporation financial statements: yearly data ($000 except per-share data)