

**GESTÃO FINANCEIRA I** GESTÃO FINANCEIRA  
CORPORATE FINANCE I **CORPORATE FINANCE**

**CADERNO DE EXERCÍCIOS 6 - SOL**  
Capítulo 18  
Financial Modeling and Pro Forma Analysis

**(de BERK, DEMARZO e HARFORD'S "FUNDAMENTALS OF  
CORPORATE FINANCE")**

**LICENCIATURA**

**2016-2017**

## Chapter 18

# Financial Modeling and Pro Forma Analysis

### Forecasting Financial Statements

Income Statement		Balance Sheet	
Sales	200,000	<b>Assets</b>	
Costs Except Depr.	(100,000)	Cash and Equivalents	15,000
EBITDA	100,000	Accounts Receivable	2,000
Depreciation	(6,000)	Inventories	4,000
EBIT	94,000	Total Current Assets	21,000
Interest Expense (net)	(400)	Property, Plant, and Equipment	10,000
Pretax Income	93,600	Total Assets	31,000
Income Tax	(32,760)	<b>Liabilities and Equity</b>	
Net Income	60,840	Accounts Payable	1,500
		Debt	4,000
		Total Liabilities	5,500
		Stockholders' Equity	25,500
		Total Liabilities and Equity	31,000

- 18.4 Jim's expects sales to grow by 10% next year. Using the percent of sales method, forecast:
- Costs (excluding depreciation).
  - Depreciation.
  - Net income.
  - Cash.
  - Accounts Receivable.
  - Inventory.
  - Property, plant, and equipment.

Use the percentage of sales method to forecast the financial line items identified in the problem.

$$\text{Forecasted sales} = 200,000 \times (1.10) = 220,000$$

$$\text{Forecasted value} = \text{current percent of sales} \times \text{forecasted sales.}$$

	Current Percent of Sales	Forecasted
a. Costs	50.00%	\$110,000
b. Depreciation	3.00%	\$6,600
c. Net Income	30.42%	\$66,924 <sup>1</sup>
d. Cash	7.50%	\$16,500
e. Accounts Receivable	1.00%	\$2,200
f. Inventory	2.00%	\$4,400
g. Property, Plant, and Equipment	5.00%	\$11,000

<sup>1</sup> Note: It is highly questionable to assume Net Income will be a fixed percentage of sales. We use this for part 18.5, but in problem 18.6 we drop this assumption and do it better.

18.5 Assume that Jim's pays out 90% of its net income. Use the percent of sales method to forecast:

- Stockholders' equity.
- Accounts Payable.

Use the percentage of sales method to forecast next year's stockholder's equity and accounts payable.

- For shareholder's equity, we need to know how much will be added to shareholder equity from net income. Additions to shareholder equity =  $66,924 \times (1 - 0.90) = 6,692$ , assuming that Net Income is going to be 66,924.

$$\text{New shareholder equity} = 25,500 + 6,692 = 32,192$$

Note: In this question we are using the assumption above, that NI is a fixed percentage of Sales. But in Problem 18.6 we will understand that this assumption would be unrealistic.

- Current percent of sales: 0.75%. Forecasted accounts payable =  $0.75\% \times 220,000 = 1,650$ .

Stockholders' equity will grow by \$6,692 (which is the amount of earnings retained in the business) to \$32,192, if we considered Net Income to be 66,924.

Accounts payable are forecasted to grow to \$1,650.

18.6 What is the amount of net new financing needed for Jim's?

Calculate Jim's net new financing for next year.

Pro forma financial statements for Jim's Espresso:

Income Statement		Balance Sheet	
Sales	220,000	<u>Assets</u>	
Costs Except Depr.	(110,000)	Cash and Equivalents	16,500
EBITDA	110,000	Accounts Receivable	2,200
Depreciation	(6,600)	Inventories	4,400
EBIT	103,400	Total Current Assets	23,100
Interest Expense (net)	(400)	Property, Plant, and Equipment	11,000
Pretax Income	103,000	Total Assets	34,100
Income Tax (35%)	(36,050)	<u>Liabilities and Equity</u>	
Net Income	<b>66,950</b>	Accounts Payable	1,650
		Debt	4,000
		Total Liabilities	5,650
		Stockholders' Equity	<b>32,195<sup>2</sup></b>
		Total Liabilities and Equity	37,845

<sup>2</sup>  $32,195 = 25,500 + 0.1 \times 66,950 = 25,500 + 6,695$ .

Total new financing required = Total assets – total liabilities and equity = –3,745.

Jim has excess financing, which means it can use the excess financing to repay debt or pay a dividend to shareholders.

Notice the (small) difference from problem 18.5 to 18.6, by changing the way in which we are forecasting net income.

**18.7 If Jim's adjusts its payout policy to 70% of net income, how will the net new financing change?**

By reducing its payout ratio, it will increase retained earnings, which are added to stockholders' equity. That additional stockholders' equity will reduce the required new financing.

For stockholders' equity, we need to know how much will be added to stockholder equity from net income. Additions to stockholder equity =  $66,950 \times (1 - 0.70) = 20,085$ . . Compared to the 90% payout ratio, these additions are  $20,085 - 6,695 = 13,390$  more, so net new financing required will be \$13,390 less.

By reducing its payout ratio, Jim's will not need to secure as much external financing to fund its growth.

## Forecasting a Planned Expansion

Use the following Income Statement and Balance Sheet for KMS for Problems 12–15

(and remember the slides from the lectures and the example in this chapter of the textbook:

1	Year	2013	% of Sales
2	<b>Income Statement (\$000s)</b>		
3	<b>Sales</b>	74,889	100%
4	Costs Except Depreciation	−58,413	78%
5	<b>EBITDA</b>	16,476	22%
6	Depreciation	−5,492	7.333%
7	<b>EBIT</b>	10,984	15%
8	Interest Expense (net)	−306	NM*
9	<b>Pretax Income</b>	10,678	14%
10	Income Tax (35%)	−3,737	NM
11	<b>Net Income</b>	6,941	9%

\*NM indicates representing the item as a percent of sales is not meaningful.

1	Year	2013	% of Sales
2	<b>Balance Sheet (\$000s)</b>		
3	<b>Assets</b>		
4	Cash and Equivalents	11,982	16%
5	Accounts Receivable	14,229	19%
6	Inventories	14,978	20%
7	<b>Total Current Assets</b>	41,189	55%
8	Property, Plant, and Equipment	49,427	66%
9	<b>Total Assets</b>	90,616	121%
10	<b>Liabilities and Stockholders' Equity</b>		
11	Accounts Payable	11,982	16%
12	Debt	4,500	NM
13	<b>Total Liabilities</b>	16,482	NM
14	<b>Stockholders' Equity</b>	74,134	NM
15	<b>Total Liabilities and Equity</b>	90,616	121%

- 18.12 Assume that KMS's market share will increase by 0.25% per year rather than the 1% used in the chapter (see Table 18.5) and that its prices remain as in the chapter. What production will KMS require each year? When will an expansion become necessary (that is, when will production volume exceed 1100)?

Compute production volumes under the revised growth assumptions.

	2013	2014	2015	2016	2017	2018
Production Volume (000 units)						
Market Size	10,000	10,500	11,025	11,576	12,155	12,763
Market Share	10.00%	10.25%	10.50%	10.75%	11.00%	11.25%
Production Volume	<b>1,000</b>	<b>1,076</b>	<b>1,158</b>	<b>1,244</b>	<b>1,337</b>	<b>1,436</b>

In 2015, production will exceed 11,000 units, and production capacity will have to be increased.

- 18.13 Under the assumption that KMS's market share will increase by 0.25% per year, you determine that the plant will require an expansion in 2015. The expansion will cost \$20 million. Assuming that the financing of the expansion will be delayed accordingly, calculate the projected interest payments (assuming that KMS still uses a 10-year bond and interest rates remain the same as in the chapter) through 2018.

Calculate financing needs, interest payments (and interest tax shields) as KMS grows.

	2013	2014	2015	2016	2017	2018
Debt and Interest Table (\$000s)						
Outstanding Debt	4,500	4,500	4,500	24,500	24,500	24,500
New Net Borrowing			20,000			
Interest on Debt	<b>306</b>	<b>306</b>	<b>306</b>	<b>1,666</b>	<b>1,666</b>	<b>1,666</b>
Interest Tax Shield	<b>107</b>	<b>107</b>	<b>107</b>	<b>583</b>	<b>583</b>	<b>583</b>

The increase in production capacity in 2015 will require KMS to issue \$20,000 in new debt financing. This will increase the amount of annual interest KMS must pay (and the amount of the interest tax shield.)

- 18.14 Under the assumption that KMS's market share will increase by 0.25% per year (and the investment and financing will be adjusted as described in Problem 13), you project the following depreciation:

Year	2013	2014	2015	2016	2017	2018
Depreciation	5,492	5,443	7,398	7,459	7,513	7,561

Using this information, project net income through 2018 (that is, reproduce Table 18.8 under the new assumptions.

Reproduce Table 18.8 under the new assumptions.

	2013	2014	2015	2016	2017	2018
Income Statement (\$000s)						
1 Sales	74,890	82,344	90,341	99,056	108,555	118,916
2 Cost of Goods Sold	(58,414)	(64,228)	(70,466)	(77,264)	(84,673)	(92,755)
3 EBITDA	16,476	18,116	19,875	21,792	23,882	26,162
4 Depreciation	(5,492)	(5,443)	(7,398)	(7,459)	(7,513)	(7,561)
5 EBIT	10,984	12,673	12,477	14,333	16,369	18,601
6 Interest Expense	(306)	(306)	(306)	(1,666)	(1,666)	(1,666)
7 Pretax Income	10,678	12,367	12,171	12,667	17,703	16,935
8 Taxes	(3,737)	(4,328)	(4,260)	(4,434)	(5,146)	(5,927)
9 Net Income	<b>6,941</b>	<b>8,038</b>	<b>7,911</b>	<b>8,234</b>	<b>9,557</b>	<b>11,007</b>

Note that net income is forecasted to decline from 2014 to 2015 as the new production capacity, with its related increase in depreciation expense, come on line.

- 18.15 Assuming that KMS's market share will increase by 0.25% per year (implying that the investment, financing, and depreciation will be adjusted as described in problems 13 and 14), and that the working capital assumptions used in the chapter still hold, calculate KMS's working capital requirements through 2018 (that is, reproduce Table 18.9 under the new assumptions).

Calculate KHS's working capital requirements through 2018.

	2013	2014	2015	2016	2017	2018
Working Capital (\$000s)						
Assets						
1 Accounts Receivable	14,229	15,645	17,165	18,821	20,625	22,594
2 Inventory	14,978	16,469	18,068	19,811	21,711	23,783
3 Cash	11,982	13,175	14,455	15,849	17,369	19,027
4 Total Current Assets	41,190	45,289	49,688	54,481	59,705	65,404
	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Liabilities						
5 Accounts Payable	11,982	13,175	14,455	15,849	17,369	19,027
6 Total Current Liabilities	11,982	13,175	14,455	15,849	17,369	19,027
Net Working Capital						
7 Net Working Capital	<b>29,207</b>	<b>32,114</b>	<b>35,233</b>	<b>38,632</b>	<b>42,336</b>	<b>46,377</b>
8 Increase in Net Working Capital	-----	<b>2,907</b>	<b>3,119</b>	<b>3,399</b>	<b>3,705</b>	<b>4,041</b>

Net working capital is forecasted to grow continually through 2018.

- 18.20 Forecast KMS's free cash flows (reproduce Table 18.13), assuming KMS's market share will increase by 0.25% per year; investment, financing, and depreciation will be adjusted accordingly; and working capital will be as you projected in Problem 15.

Calculate KMS's free cash flow through 2018.

	2013	2014	2015	2016	2017	2018
Free Cash Flow (\$000s)						
1 Net Income	6,941	8,038	7,911	8,234	9,557	11,007
2 Plus: After-Tax Interest Expense	199	199	199	1,083	1,083	1,083
3 EBIT (1-Tc)	7,139	8,237	8,110	9,317	10,640	12,090
4 Plus: Depreciation	5,492	5,443	7,398	7,459	7,513	7,561
5 Less: Increases in NWC	-----	(2,907)	(3,119)	(3,399)	(3,705)	(4,041)
6 Less: Capital Expenditures	(5,000)	(5,000)	(28,000)	(8,000)	(8,000)	(8,000)
7 Free Cash Flow of Firm	<b>7,631</b>	<b>5,773</b>	<b>(15,611)</b>	<b>5,377</b>	<b>6,448</b>	<b>7,611</b>

KMS should generate positive free cash flow in each year except 2015. 2015 is the year that KMS must expand production capacity and that will require a large increase in capital expenditures.

Note: assuming zero increase in NWC from 2012 to 2013 (due to lack of prior information).