

# Financial Modeling and Pro Forma Analysis

Gestão Financeira I  
Gestão Financeira  
Corporate Finance I  
Corporate Finance

Licenciatura  
Undergraduate Program

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# Outline

- Chapter 18 of BDH
1. Goals of Long-Term Financial Planning
  2. Forecasting Financial Statements: The Percent of Sales Method
  3. Forecasting a planned expansion
  4. Valuing the expansion

# Goals of Long-Term Forecasting

- Identify important linkages
  - Sales, costs, capital investment, financing, etc.
- Analyze the impact of potential business plans
- Plan for future funding needs

# Forecasting Financial Statements: the percent of sales method

- A forecasting method that **assumes that balance sheet and income statement items grow proportionately with sales**
  - Percent of sales remains constant in future periods
  - Forecasts of balance sheet and income statement items are made as a percent of the expected sales figure for that period

# The percent of sales method: Example

Table 18.1a  
KMS Designs 2013 Income Statement

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.

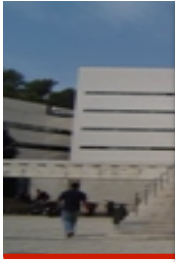


Table 18.1b  
KMS Designs 2013 Balance Sheet

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%

# Forecasting the Income Statement

- KMS Designs forecasts 18% growth in sales from 2013 to 2014
- In 2013:
  - Costs excluding depreciation were 78% of sales
  - Depreciation was 7.333% of sales
  - Tax rate =  $3,737 / 10,678 = 35\%$
- **For now**, assume interest expense remains the same as 2013

# Table 18.2 Forecasted Income Statement for 2014 (version #1)

1	Year	2013	2014	Calculation
2	<b>Income Statement (\$000s)</b>			
3	<b>Sales</b>	74,889	88,369	$74,889 \times 1.18$
4	Costs Except Depreciation	-58,413	-68,928	78% of Sales
5	<b>EBITDA</b>	16,476	19,441	Lines 3 + 4
6	Depreciation	-5,492	-6,480	7.333% of Sales
7	<b>EBIT</b>	10,984	12,961	Lines 5 + 6
8	Interest Expense (net)	-306	-306	Remains the same
9	<b>Pretax Income</b>	10,678	12,655	Lines 7 + 8
10	Income Tax (35%)	-3,737	-4,429	35% of Line 9
11	<b>Net Income</b>	<b>6,941</b>	<b>8,226</b>	Lines 9 + 10




# Forecasting the Balance Sheet

- Pro Forma Balance Sheet
  - Make assumptions about how equity and debt will grow with sales
  - The difference between Assets and L+E indicates the net new financing to fund growth
  - In this example, let's assume that 30% of the net income is paid out as a dividend and 70% is retained earnings.

# Table 18.3 Forecasted Balance Sheet for 2014 (version #1)

1	Year	2013	2014	Calculation
2	<b>Balance Sheet (\$000s)</b>			
3	<b>Assets</b>			
4	Cash and Cash Equivalents	11,982	14,139	16% of Sales
5	Accounts Receivable	14,229	16,790	19% of Sales
6	Inventories	14,978	17,674	20% of Sales
7	<b>Total Current Assets</b>	41,189	48,603	Lines 4 + 5 + 6
8	Property, Plant, and Equipment	49,427	58,324	66% of Sales
9	<b>Total Assets</b>	90,616	106,927	Lines 7 + 8
10	<b>Liabilities</b>			
11	Accounts Payable	11,982	14,139	16% of Sales
12	Debt	4,500	4,500	Remains the same
13	<b>Total Liabilities</b>	16,482	18,639	Lines 11 + 12
14	<b>Stockholders' Equity</b>	74,134	79,892	74,134 + 70% of 8,226
15	<b>Total Liabilities and Equity</b>	90,616	98,531	Lines 13 + 14
16	<b>Net New Financing</b>		8,396	Line 9 – Line 15

# Forecasting the Balance Sheet again

- Making the Balance Sheet Balance:  
**Net New Financing**
    - Management must choose new funding
      - Debt or equity.
      - Complicated issues involved are covered in Chapters 14 and 15 (GF2 or CF2 course units).
    - If debt is chosen, it will change the interest assumption on the pro forma income statement. Let's check what happens
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# Table 18.4 Forecasted Balance Sheet for 2014 (version #2)

1	Year	2013	2014	Calculation
2	<b>Balance Sheet (\$000s)</b>			
3	<b>Assets</b>			
4	Cash and Cash Equivalents	11,982	14,139	16% of Sales
5	Accounts Receivable	14,229	16,790	19% of Sales
6	Inventories	14,978	17,674	20% of Sales
7	<b>Total Current Assets</b>	41,189	48,603	Lines 4 + 5 + 6
8	Property, Plant, and Equipment	49,427	58,324	66% of Sales
9	<b>Total Assets</b>	90,616	106,927	Lines 7 + 8
10	<b>Liabilities</b>			
11	Accounts Payable	11,982	14,139	16% of Sales
12	Debt	4,500	12,896	4,500 + 8,396
13	<b>Total Liabilities</b>	16,482	27,035	Lines 11 + 12
14	<b>Stockholders' Equity</b>	74,134	79,892	74,134 + 70% of 8,226
15	<b>Total Liabilities and Equity</b>	90,616	106,927	Lines 13 + 14

# Forecasting Financial Statements: the percent of sales method - comments

- Comments:
  - The amount of net new financing will depend on payout and retention of earnings.
  - The increase in debt will be reflected in larger interest expenses in 2015, etc.
- Choosing a Forecast Target
  - Target specific ratios that the company wants or needs to maintain.
    - Debt covenants to maintain liquidity or interest coverage
  - Investment, payout, and financing decisions are linked together
    - Financial managers must balance these decisions
    - Careful forecasting helps see consequences

# Forecasting a planned Expansion

- Percent of sales method ignores real-world “lumpy” investments in capacity.
  - Can’t buy half of a factory, or add retail space by the square foot.
  - Added in one lump investment in new Property, Plant and Equipment.
- Firms often make large investments that will provide capacity for several years.
- **Analyzing the effect of a planned expansion on firm value:**
  - Identify **capacity needs and financing options**
  - Construct **pro forma income statements and forecast future cash flows**
  - Use forecasted free cash flows to assess the impact of expansion

# Forecasting a planned Expansion: Example – capacity estimates

Table 18.5  
KMS's Forecasted Production Capacity Requirements

1	Year	2013	2014	2015	2016	2017	2018
2	<b>Production Volume (000s units)</b>						
3	Market Size	10,000	10,500	11,025	11,576	12,155	12,763
4	Market Share	10.0%	11.0%	12.0%	13.0%	14.0%	15.0%
5	Production Volume (Line 3 × Line 4)	1,000	1,155	1,323	1,505	1,702	1,914
6	<b>Additional Market Information</b>						
7	Average Sales Price	\$ 74.89	\$ 76.51	\$ 78.04	\$ 79.60	\$ 81.19	\$ 82.82

# Forecasting a planned Expansion: Example - CapEx

- Capital Expenditures for the Expansion
  - New PP&E = \$20 million
  - Must be purchased in 2014 to meet minimum capacity requirements
  - KMS must invest \$5 million each year to replace depreciated equipment
  - After expansion, KMS must invest \$8 million per year for depreciation 2015-2018

Table 18.6

KMS's Forecasted Capital Expenditures

1	Year	2013	2014	2015	2016	2017	2018
2	<b>Fixed Assets and Capital Investment (\$000s)</b>						
3	Opening Book Value	49,919	49,427	66,984	67,486	67,937	68,344
4	Capital Investment	5,000	25,000	8,000	8,000	8,000	8,000
5	Depreciation	-5,492	-7,443	-7,498	-7,549	-7,594	-7,634
6	Closing Book Value	49,427	66,984	67,486	67,937	68,344	68,709

Note: this example from BDH gives us Depreciation already computed using US accounting rules for the equipment. Could be done with straight-line depreciation as well.



# Forecasting a planned Expansion: Example – Financing and Interest Payments

- **Financing the Expansion**
  - KMS will fund recurring investment from operating cash flows
  - KMS will finance the new equipment by issuing 10-year coupon bonds with a coupon rate of 6.8%.

Table 18.7  
KMS's Planned Debt and Interest Payments

1	Year		2013	2014	2015	2016	2017	2018
2	<b>Debt and Interest Table (\$000s)</b>							
3	Outstanding Debt		4,500	24,500	24,500	24,500	24,500	24,500
4	Net New Borrowing		—	20,000	—	—	—	—
5	Interest on Debt	6.80%	306	306	1,666	1,666	1,666	1,666

$1666 = 306 + 6.8\% * 20,000 = 306 + 1,360$

# Forecasting a planned Expansion: Example – Pro Forma Income Statement

- KMS Designs' Pro Forma Income Statement
  - Value of new investment opportunity comes from future cash flows from investment
  - Estimate cash flows:
    1. Project future earnings
    2. Consider working capital and investment needs and estimate free cash flow
    3. Compute value of company with/without expansion.

# Forecasting a planned Expansion: Example – Pro Forma Income Statement

Forecasting Earnings:  $\text{Sales} = \text{Market Size} \times \text{Market Share} \times \text{Average Sales Price}$

Table 18.8  
Pro Forma Income Statement for KMS Expansion

1 Year	2013	2014	2015	2016	2017	2018
2 <b>Income Statement (\$000s)</b>						
3 <b>Sales</b>	74,889	88,369	103,247	119,793	138,167	158,546
4 <b>Costs Except Depreciation</b>	-58,413	-68,928	-80,533	-93,438	-107,770	-123,666
5 <b>EBITDA</b>	16,476	19,441	22,714	26,354	30,397	34,880
6 <b>Depreciation</b>	-5,492	-7,443	-7,498	-7,549	-7,594	-7,634
7 <b>EBIT</b>	10,984	11,998	15,216	18,806	22,803	27,246
8 <b>Interest Expense (net)</b>	-306	-306	-1,666	-1,666	-1,666	-1,666
9 <b>Pretax Income</b>	10,678	11,692	13,550	17,140	21,137	25,580
10 <b>Income Tax 35%</b>	-3,737	-4,092	-4,742	-5,999	-7,398	-8,953
11 <b>Net Income</b>	6,941	7,600	8,807	11,141	13,739	16,627

78% x sales

Table 18.6

Table 18.5

Table 18.7

Forecasting Period

# Forecasting a planned Expansion: Example – Working Capital Needs

- Working Capital Requirements
  - Increases in working capital reduce free cash flow
  - KMS Example:
    - We assume minimum **cash requirements** will remain 16% of sales, **A/R** (accounts receivable)= 19% of sales, **Inventory** = 20% of sales, **A/P** (accounts payable) = 16% of sales as in 2013
    - We are going to assume that **Excess cash** is distributed as dividends.

# Forecasting a planned Expansion: Example – Working Capital Needs

Table 18.9  
KMS Projected Working Capital Needs

1 Year	2013	2014	2015	2016	2017	2018
2 Working Capital (\$000s)						
3 Assets						
4 Cash	11,982	14,139	16,520	19,167	22,107	25,367
5 Accounts Receivable	14,229	16,790	19,617	22,761	26,252	30,124
6 Inventory	14,978	17,674	20,649	23,959	27,633	31,709
7 Total Current Assets	41,189	48,603	56,786	65,886	75,992	87,201
8 Liabilities						
9 Accounts Payable	11,982	14,139	16,520	19,167	22,107	25,367
10 Total Current Liabilities	11,982	14,139	16,520	19,167	22,107	25,367
11 Net Working Capital						
12 Net Working Capital (7 – 10)	29,207	34,464	40,266	46,719	53,885	61,833
13 Increase in Net Working Capital		5,257	5,802	6,453	7,166	7,948

Note 1: Lines 4 and 9 are 16% of annual sales (Table 18.8)

Note 2: Line 5 is 19% of annual sales (Table 18.8)

Note 3: Line 6 is 20% of annual sales (Table 18.8)

# Forecasting a planned Expansion: Example – Pro Forma Balance Sheet

- Forecasting the Balance Sheet
  - When we forecast  $L+E > A$ , excess cash is available
    - Options:
      - Build extra cash reserves
      - Retire debt
      - Distribute excess as dividends (note: we are assuming this in our example – check next slide)
      - Repurchase shares
  - When  $L+E < A$ , additional financing is needed

# Forecasting a planned Expansion: Example – Pro Forma Balance Sheet

Table 18.10  
Pro Forma Balance Sheet for KMS, 2014

1 Year	2013	2014	Source for 2014 Data	2014 (Revised)
<b>2 Balance Sheet (\$000s)</b>				
<b>3 Assets</b>				
4 Cash and Cash Equivalents	11,982	14,139	Table 18.9	14,139
5 Accounts Receivable	14,229	16,790	Table 18.9	16,790
6 Inventories	14,978	17,674	Table 18.9	17,674
<b>7 Total Current Assets</b>	41,189	48,603	Lines 4 + 5 + 6	48,603
8 Property, Plant, and Equipment	49,427	66,984	Table 18.6	66,984
<b>9 Total Assets</b>	90,616	115,587	Lines 7 + 8	115,587
<b>10 Liabilities</b>				
11 Accounts Payable	11,982	14,139	Table 18.9	14,139
12 Debt	4,500	24,500	Table 18.7	24,500
<b>13 Total Liabilities</b>	16,482	38,639	Lines 11 + 12	38,639
<b>14 Stockholders' Equity</b>				
15 Starting Stockholders' Equity	69,275	74,134	2013 Line 18	74,134
16 Net Income	6,941	7,600	Table 18.8	7,600
17 Dividends	-2,082	0	Assumed	-4,786
<b>18 Stockholders' Equity</b>	74,134	81,734	Lines 15 + 16 + 17	76,948
<b>19 Total Liabilities and Equity</b>	90,616	120,373	Lines 13 + 18	115,587



# Forecasting a planned Expansion: Example – Free Cash Flows

- Calculate the net present value of the increase in **cash flows** generated by the investment
- First, we calculate **forecasted free cash flows**
  - Start with Net Income
  - Add interest expense with tax shield effect
  - Add back depreciation (not a cash expense)
  - Subtract changes in NWC and capital expenditures

Equivalent to:  
EBIT (1-Tc)

$$FCF = EBIT(1 - T_c) + Dep - CapEx - \Delta NWC$$

or

$$FCF = NetIncome + InterestExpense * (1 - T_c) + Dep - CapEx - \Delta NWC$$



# Forecasting a planned Expansion: Example – Free Cash Flows of Firm including expansion

Table 18.13  
KMS Forecasted Free Cash Flow

1	Year	2014	2015	2016	2017	2018
2	Free Cash Flow (\$000s)					
3	Net Income <small>Table 18.8, Line 11</small>	7,600	8,807	11,141	13,739	16,627
4	Plus: After-Tax Interest Expense	199	1,083	1,083	1,083	1,083
5	Unlevered Net Income = $EBIT(1-T_c)$	7,799	9,890	12,224	14,822	17,710
6	Plus: Depreciation <small>Table 18.8, Line 6</small>	7,443	7,498	7,549	7,594	7,634
7	Less: Increases in NWC <small>Table 18.9 Line 13</small>	-5,257	-5,802	-6,453	-7,166	-7,948
8	Less: Capital Expenditures <small>Table 18.6, Line 4</small>	-25,000	-8,000	-8,000	-8,000	-8,000
9	Free Cash Flow of Firm	-15,015	3,586	5,320	7,250	9,396

Interest Expense –  $T_c \times \text{Interest Expense}$   
 $1666 - 0.35 \times 1666 = 1083$

# Valuing a planned Expansion

- Based on the cash flows of the firm including the expansion and comparing them to what would happen without the expansion (incremental perspective);
- And on the weighted average cost of capital;
- We could then compute a NPV for the decision to go ahead with the expansion project. (more details on GF2 or CF2 course units).