Case Study – Bread and Butter

Question Appeared in: ModelOff 2015 Round 1

Time Allocated: 40 minutes

40 Marks available in this Section

INTRODUCTION

You are in the final stages of applying for a job as an analyst at a small private equity firm. The help assess your skills, the firm asks you to complete what it calls its "Bread and Butter" test – an example of the fundamental model building work that its analysts need to do day in and day out. You will need to build a dynamic financial model showing the forecast performance of a fictitious technology company they are looking to purchase, Macrohard.

The firm would like a "3-way integrated financial model" – that is a model which includes the 3 standard financial statements (Profit and Loss, Balance Sheet, Cash Flow Statement) and allows updates to assumption values to correctly flow through to all of the financial statements. In order to model the statements correctly you will also need to do some simple modelling of a debt facility and depreciation tranches. The final output of the model will be the distributions to equity investors and the IRR achieved by the equity investors.

Information is provided below regarding the assumed forecast performance of Macrohard as well as general model assumptions. Use your model to answer the case study questions.

To assist you, a workbook has been provided that includes some of the assumptions you will need, plus a template for the Balance Sheet, and Profit and Loss Statement. No template is provided for the Cash Flow Statement.

ASSUMPTIONS

General Model Assumptions

- Your model should be an annual model showing 10 calendar year time periods, plus the initial "Day 0" Balance Sheet.

- The equity investment date ("Day 0") is 31 December 2015.

- The first period ("Year 1") covers 1 January 2016 to 31 December 2016, and the final model period ("Year 10") covers 1 January 2025 to 31 December 2025. Any activity after year 10 is ignored for analysis purposes and is not modelled.

- Unless otherwise specified, assume all cashflows occur on the final day of the period.

Day 0 Transactions / Initial Investment

- $30,000,000 equity is invested on Day 0.

- $20,000,000 debt is borrowed on Day 0.

- The Balance Sheet Assets on Day 0 are:

    - $3,000,000 cash

    - $3,000,000 accounts receivable

    - $4,000,000 inventory

    - $40,000,000 Property Plant and Equipment ("PPE")

Revenues

- Year 1 Sales are $25,000,000.

- Sales grow annually by the *minimum* of either (i) $3,000,000 or (ii) 8% of the previous year's sales.

Cost of Goods Sold

- Cost of Goods Sold equals 60% of sales

Expenses

- Year 1 Expenses are $3,000,000

- Expenses grow annually by 7% of the previous year's expenses.

Capital Expenditure

- On the final day of Year 4, additional PPE is purchased for $10,000,000.

- This new purchase is 90% funded by an equity injection on the same day, with the remainder funded by cash on hand.

Depreciation

- The original $40,000,000 PPE (purchased on Day 0) depreciates over 10 years in a straight line method ($4,000,000 per year).

- The new PPE (purchased at the end of year 4) depreciates over 5 years in a straight line method.

Debt

- Interest is charged on the outstanding debt at a rate of 6.50% per annum. Interest is paid at the end of each year.

- Principal repayments (i.e. not counting interest) are $2,500,000 per year until the debt is repaid. Repayments are made at the end of each year, immediately after interest payments are made.

Payment Terms / Working Capital

- Inventory at the end of each year is equal to 30% of Cost of Goods Sold
- Accounts Receivable at the end of each year are 10% of Sales
- Accounts Payable at the end of each year are 12% of Cost of Goods Sold plus 15% of Expenses

Distributions to Equity

- At the end of each of year, any amount above $4,000,000 in the cash account after all other considerations are dealt with is distributed to equity investors. If there is less than or equal to $4,000,000 in the cash account prior to distributions, no distribution is made that year. Sizing of distributions is only constrained by cash available - not by book profits.

Other Considerations

- Assume that all taxes are zero.
- Assume that no interest is earned / paid on Macrohard's positive / negative cash account balance.

Questions

Question 1

To the nearest thousand dollars, what is the value of Sales in Year 3? [2 marks]

a. $29,159,000

b. $29,160,000

c. $29,161,000

d. $29,162,000

e. $29,163,000

f. $29,164,000

Question 2

To the nearest thousand dollars, what is the value of Sales in Year 9? [2 marks]

a. $45,669,000

b. $45,670,000

c. $45,671,000

d. $45,672,000

e. $45,673,000

f. $45,674,000

Question 3

To the nearest thousand dollars, what is the total value of Cost of Goods Sold over all 10 years? [2 marks]

a. $216,046,000

b. $216,047,000

c. $216,048,000

d. $216,049,000

e. $216,050,000

f. $216,051,000

Question 4

To the nearest 0.01%, what is the value of Year 7 Expenses as a percentage of Year 7 Sales? [2 marks]

a. 11.30%

b. 11.31%

c. 11.32%

d. 11.33%

e. 11.34%

f. 11.35%

Question 5

To the nearest thousand dollars, what is the total value of Interest paid over all 10 years? [3 marks]

a. $5,847,000

b. $5,848,000

c. $5,849,000

d. $5,850,000

e. $5,851,000

f. $5,852,000

Question 6

To the nearest million dollars, what is the book value of all PPE at the end of year 7? [3 marks]

a. $15,000,000

b. $16,000,000

c. $17,000,000

d. $18,000,000

e. $19,000,000

f. $20,000,000

Question 7

To the nearest thousand dollars, what is the value of Inventory at the end of year 5? [2 marks]

a. $6,117,000

b. $6,118,000

c. $6,119,000

d. $6,120,000

e. $6,121,000

f. $6,122,000

Question 8

To the nearest thousand dollars, what is the value of Total Assets at the end of year 6? [3 marks]

a. $36,285,000

b. $36,286,000

c. $36,287,000

d. $36,288,000

e. $36,289,000

f. $36,290,000

Question 9

To the nearest thousand dollars, what is the value of Accounts Payables at the end of year 4? [3 marks]

a. $2,817,000

b. $2,818,000

c. $2,819,000

d. $2,820,000

e. $2,821,000

f. $2,822,000

Question 10

To the nearest thousand dollars, what is the value of Net Profit (before distributions) in year 9? [3 marks]

a. $7,111,000

b. $7,112,000

c. $7,113,000

d. $7,114,000

e. $7,115,000

f. $7,116,000

Question 11

To the nearest thousand dollars, what is the value of Net Cash Flow (before distributions) in year 4? [3 marks]

a. $4,158,000

b. $4,159,000

c. $4,160,000

d. $4,161,000

e. $4,162,000

f. $4,163,000

Question 12

To the nearest thousand dollars, what is the total amount of distributions to equity over 10 years? [3 marks]

a. $72,437,000

b. $72,438,000

c. $72,439,000

d. $72,440,000

e. $72,441,000

f. $72,442,000

Question 13

To the nearest thousand dollars, what is the Balance Sheet value of Total Equity (also known as Shareholders' Funds) at the end of year 10? [3 marks]

a. $13,295,000

b. $13,296,000

c. $13,297,000

d. $13,298,000

e. $13,299,000

f. $13,300,000

Question 14

To the nearest 0.01%, what is the Internal Rate of Return of Equity Cash Flows over the modelled period, using Excel's IRR function? Do not use the XIRR function for this question. [3 marks]

a. 11.88%

b. 11.89%

c. 11.90%

d. 11.91%

e. 11.92%

f. 11.93%

Question 15

Assume that Sales grow by a set percentage year on year, rather than as the minimum of a fixed amount or a set percentage. Do not change any other assumptions. To the nearest 0.01%, what does this sales growth percentage now need to be in order to achieve an equity IRR of 13.00% using Excel's IRR function? Do not use the XIRR function for this question. [3 marks]

a. 8.59%

b. 8.60%

c. 8.61%

d. 8.62%

e. 8.63%

f. 8.64%

Answers

1	B
2	D
3	F
4	F
5	D
6	B
7	F
8	A
9	C
10	D
11	C
12	B
13	B
14	E
15	E