LEVEL 1: CORPORATE FINANCE

Reading 32 (6th out of 6): LEVERAGE & BREAKEVEN POINT

Difficulty: **easy**

Benchmark Study Time: **2h**

2022

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THIS E-BOOK:

- is a selective summary of the corresponding Reading in your CFA® Program Curriculum,
- provides place for your own notes,
- helps you structure your study and revision time!

How to use this e-book to maximize your knowledge retention:

1. **Print** the e-book in duplex and bind it to keep **all** important info for this Reading **in one place.**
2. **Read** this e-book, best twice, to grasp the idea of what this Reading is about.
3. **Study** the Reading from your curriculum. **Here add** your notes, examples, formulas, definitions, etc.
4. **Review** the Reading using this e-book, e.g. write your summary of key concepts or revise the formulas at the end of this e-book (if applicable).
5. **Done?** Go to your study plan and change the Reading's status to **green**:
   (it will make your Chance-to-Pass-Score™ grow ☺).
6. **Come back** to this e-book from time to time to **regularly review for knowledge retention!**

NOTE: While studying or reviewing this Reading, you can use the tables at the end of this e-book and mark your study/review sessions to hold yourself accountable.

LEVERAGE

Leverage – Definition

Leverage provides information on how sensitive different categories of earnings are to changes in different items of a company's income statement.

Leverage:

- Leverage increases the volatility of a company's earnings and cash flows.
- The greater a company's leverage, the greater the company's risk.
- The company's cost structure affects the level of leverage.

Variable costs vs Fixed costs

Costs are divided into:

- variable costs,
- fixed costs.

Variable costs are costs that fluctuate with the level of production and sales.

Fixed costs are not dependent on the level of production and sales.

Types of risk

Types of risk:

- business risk,
- sales risk,
- operating risk, and
- financial risk.

Business Risk

Business risk is the risk associated with operating earnings which, in turn, depend on revenues.

Business risk:

- sales risk,
- operating risk.

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The greater the standard deviation of the number and price of the units sold, the greater the sales risk.

The greater the share of fixed costs in total costs, the greater the operating risk.

Degree of Operating Leverage (DOL)

DOL is the ratio of the percentage change in operating income to the percentage change in units sold:

$$\mathrm{DOL} = \frac{\text{percentage change in operating income}}{\text{percentage change in units sold}}$$

$$\mathrm{DOL} = \frac{Q \times (P - V)}{Q \times (P - V) - F}$$

Where:

- Q – number of units sold,
- P – price per unit,
- V – variable cost per unit,
- F – fixed operating cost,
- $Q \times (P - V)$ – contribution margin.

Interpretation of DOL

DOL = 1.3

If sales increase by 4%, then:

- the operating profit will grow by 1.3 x 4% = 5.2%

If sales decrease by 4%, then:

- the operating profit will fall by 5.2%

DOL tells us how much a change in sales affects the operating income.

- The operating income is most sensitive to changes in sales volume if sales are close to the operating breakeven point.
- The operating breakeven point is the number of units sold at which the company's operating income is zero.

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Financial risk

Financial risk is the risk associated with debt financing used by the company to finance its operations. Taking on fixed obligations, such as debt and long-term leases, directly influences the financial risk. Therefore, the higher the company's fixed-cost financial obligations, the greater its financial risk.

Degree of Financial Leverage (DFL)

DFL is the ratio of the percentage change in net income to the percentage change in operating income:

$$\mathrm{DFL} = \frac{\text{percentage change in net income}}{\text{percentage change in operating income}}$$

$$\mathrm{DFL} = \frac{Q \times (P - V) - F}{Q \times (P - V) - F - C}$$

Where:

- Q – number of units sold,
- P – price per unit,
- V – variable cost per unit,
- F – fixed operating cost,
- C – fixed financial cost,
- $Q \times (P - V)$ – contribution margin.

DFL tells us how much a change in operating income affects the net income.

The degree of financial leverage changes at different amounts of units sold. What's more, the greater the company's fixed financial obligations, the greater the sensitivity of net income to changes in operating income.

The degree of financial leverage is often a choice left to the company's management. Therefore, the degree of financial leverage may be different among companies in the same industry.

higher financial leverage → higher volatility of net income → higher volatility of ROE

HERE KNOWLEDGE RETENTION HAPPENS | WRITE: notes, examples, formulas, definitions, relations, etc.

Degree of Total Leverage (DTL)

DTL is the ratio of the percentage change in net income to the percentage change in units sold:

$$\text{DTL} = \frac{\text{percentage change in net income}}{\text{percentage change in units sold}}$$

$$\text{DTL} = \text{DOL} \times \text{DFL} = \frac{\text{Q} \times (\text{P} - \text{V})}{\text{Q} \times (\text{P} - \text{V}) - \text{F} - \text{C}}$$

Where:

- Q – number of units sold,
- P – price per unit,
- V – variable cost per unit,
- F – fixed operating cost,
- C – fixed financial cost,
- $\text{Q} \times (\text{P} - \text{V})$ – contribution margin.

DTL tells us how much a change in sales affects the net income.

HERE KNOWLEDGE RETENTION HAPPENS | WRITE: notes, examples, formulas, definitions, relations, etc.

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BREAKEVEN POINTS

Breakeven point

The breakeven point is the number of units sold at which revenues are equal to costs, so the company's net income is zero.

revenues = costs

$$P \times Q_{BE} = V \times Q_{BE} + C + F$$

Where:

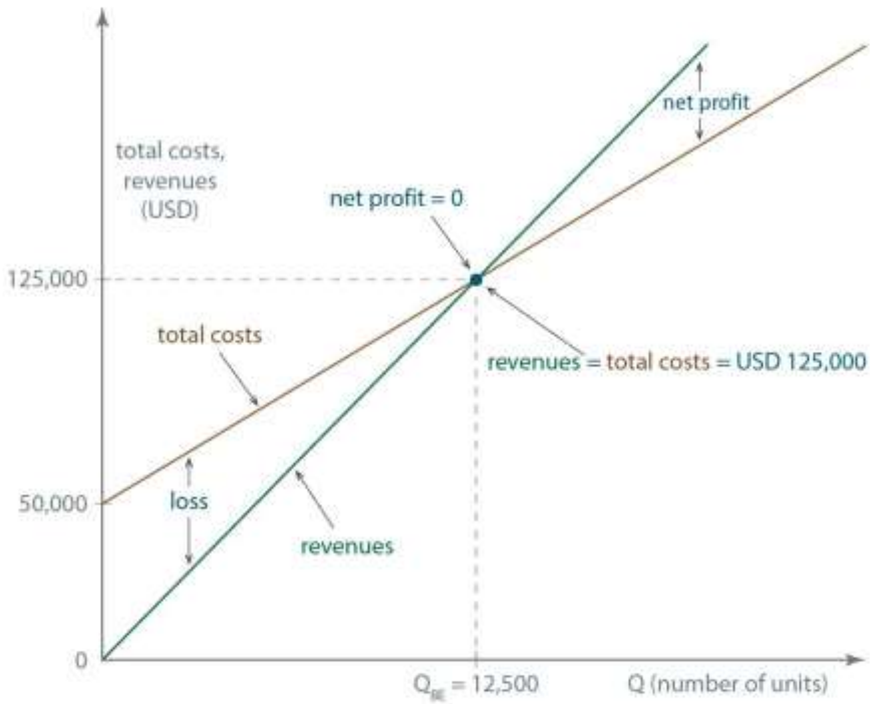
- P – price per unit,
- Q_{BE} – breakeven point (number of units sold),
- V – variable costs per unit,
- F – fixed operating costs,
- C – fixed financial costs.

Formula for the breakeven point:

$$Q_{BE} = \frac{C + F}{P - V}$$

Example

The Chicango, Inc. company produces a homogeneous product at a price of USD 10 per unit whose variable cost per unit is USD 6. The fixed operating costs are USD 30,000 and the fixed financial costs are USD 20,000. What is the value of the breakeven point of the company?



HERE KNOWLEDGE RETENTION HAPPENS | WRITE: notes, examples, formulas, definitions, relations, etc.

Operating breakeven point

The operating breakeven point is the number of units sold at which the company's revenues are equal to operating costs, so the operating profit is equal to 0.

$$\text{revenues} = \text{operating costs}$$

$$P \times Q_{OBE} = V \times Q_{OBE} + F$$

Where:

- P – price per unit,
- Q_{OBE} – operating breakeven point (number of units sold),
- V – variable costs per unit,
- F – fixed operating costs.

Formula for the operating breakeven point:

$$Q_{OBE} = \frac{F}{P - V}$$

Breakeven points characteristics

- The breakeven point is strongly associated with both financing and operating leverage.
- Companies with a high degree of leverage have a relatively high breakeven point.
- The variability of the degree of operating leverage and the degree of financing leverage is the largest for production around the breakeven point.

breakeven point > operating breakeven point

Types of bankruptcies

Types of bankruptcies:

- a negotiated reorganization,
- a liquidation.

negotiated reorganization = reconstructing the capital structure + temporary protection from creditors

liquidation = selling the assets in order to satisfy the creditors' claims

HERE KNOWLEDGE RETENTION HAPPENS | WRITE: notes, examples, formulas, definitions, relations, etc.

Summarizing key concepts:

☐ Variable costs vs Fixed costs

My summary:

☐ Types of risk

My summary:

☐ Degree of Operating Leverage (DOL) – formula, interpretation

My summary:

☐ Degree of Financial Leverage (DFL) – formula, interpretation

My summary:

☐ Degree of Total Leverage (DTL) – formula, interpretation

My summary:

☐ Breakeven point

My summary:

☐ Operating breakeven point

My summary:

☐ Types of bankruptcies

My summary:

Reviewing formulas:

$$\mathrm{DOL} = \frac{\mathrm{Q} \times (\mathrm{P} - \mathrm{V})}{\mathrm{Q} \times (\mathrm{P} - \mathrm{V}) - \mathrm{F}}$$

Write down the formula:

$$\mathrm{DFL} = \frac{\mathrm{Q} \times (\mathrm{P} - \mathrm{V}) - \mathrm{F}}{\mathrm{Q} \times (\mathrm{P} - \mathrm{V}) - \mathrm{F} - \mathrm{C}}$$

Write down the formula:

$$\mathrm{DTL} = \mathrm{DOL} \times \mathrm{DFL} = \frac{\mathrm{Q} \times (\mathrm{P} - \mathrm{V})}{\mathrm{Q} \times (\mathrm{P} - \mathrm{V}) - \mathrm{F} - \mathrm{C}}$$

Write down the formula:

$$\mathrm{Q}_{\mathrm{BE}} = \frac{\mathrm{C} + \mathrm{F}}{\mathrm{P} - \mathrm{V}}$$

Write down the formula:

$$\mathrm{Q}_{\mathrm{OBE}} = \frac{\mathrm{F}}{\mathrm{P} - \mathrm{V}}$$

Write down the formula:

Keeping myself accountable:

TABLE 1 | STUDY

When you sit down to study, you may want to **try the Pomodoro Technique** to handle your study sessions: study for 25 minutes, then take a 5-minute break. Repeat this 25+5 study-break sequence all throughout your daily study session.

✔ Tick off as you proceed.

POMODORO TIMETABLE: study-break sequences (25′ + 5′)													
date		date		date		date		date		date		date	
25′		25′		25′		25′		25′		25′		25′	
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TABLE 2 | REVIEW

Never ever neglect revision! Though it's not the most popular thing among CFA candidates, regular revision is what makes the difference. If you want to pass your exam, **schedule & do your review sessions.**

REVIEW TIMETABLE: When did I review this Reading?													
date		date		date		date		date		date		date	
date		date		date		date		date		date		date	