UKRIDA

LEVERAGE & CAPITAL STRUCTURE

LEVERAGE AND CAPITAL STRUCTURE

Learning Goals

- Understand the effect of financial leverage on cash flows and cost of equity
- Understand the impact of taxes and bankruptcy on capital structure choice
- Understand the basic components of bankruptcy

Outline

- The capital structure question
- The effect of financial leverage
- Capital structure and the cost of equity
- Corporate taxes and capital structure
- Bankruptcy cost
- Optimal Capital Structure
- Observed Capital Structures
- a quick look at the bankruptcy process

THE ISSUE

Can the use of debt increase the value of a firm's equity,
Specifically, the firm's stock price

The relationship between capital structure and stock price is not precise nor fully understood

- Under certain conditions changing leverage increases stock price,
- An optimal capital structure maximizes stock price
- Leverage influences stock price- Alters the risk/return relationship in an equity investment

BACKGROUND

The primary goal of financial managers is –Maximize stockholder wealth maximize the firm and stock value.

We want to choose the capital structure that will maximize stockholder wealth. Changing capital structure influences the cost of capital.

We can maximize stockholder wealth by maximizing firm value or minimizing WACC.Basing on discounted cash flow approach, it is clear that the minimum level of cost of capital would maximize the value of firm.

VALUE OF THE FIRM

- The value of a firm is defined to be the sum of the value of the firm's debt and the firm's equity.
- If the goal of the firm's management is to make the firm as valuable as possible, then the firm should pick the debt-equity ratio that makes the pie as big as possible.
- changes in capital structure benefit the stockholders if and only if the value of the firm increases.

DEFINITION

Capital Structure:
Percentage of debt and equity used to fund the firm's assets

Leverage:
use of debt in capital structure
Financial leverage of 20% means the firm’s capital structure contains 20% debt and 80%equity

Capital Restructuring:
Changing the amount of leverage without the changing the firm's assets -increase leverage by issuing debt and repurchasing outstanding shares or decrease leverage by issuing new shares and retiring outstanding debt

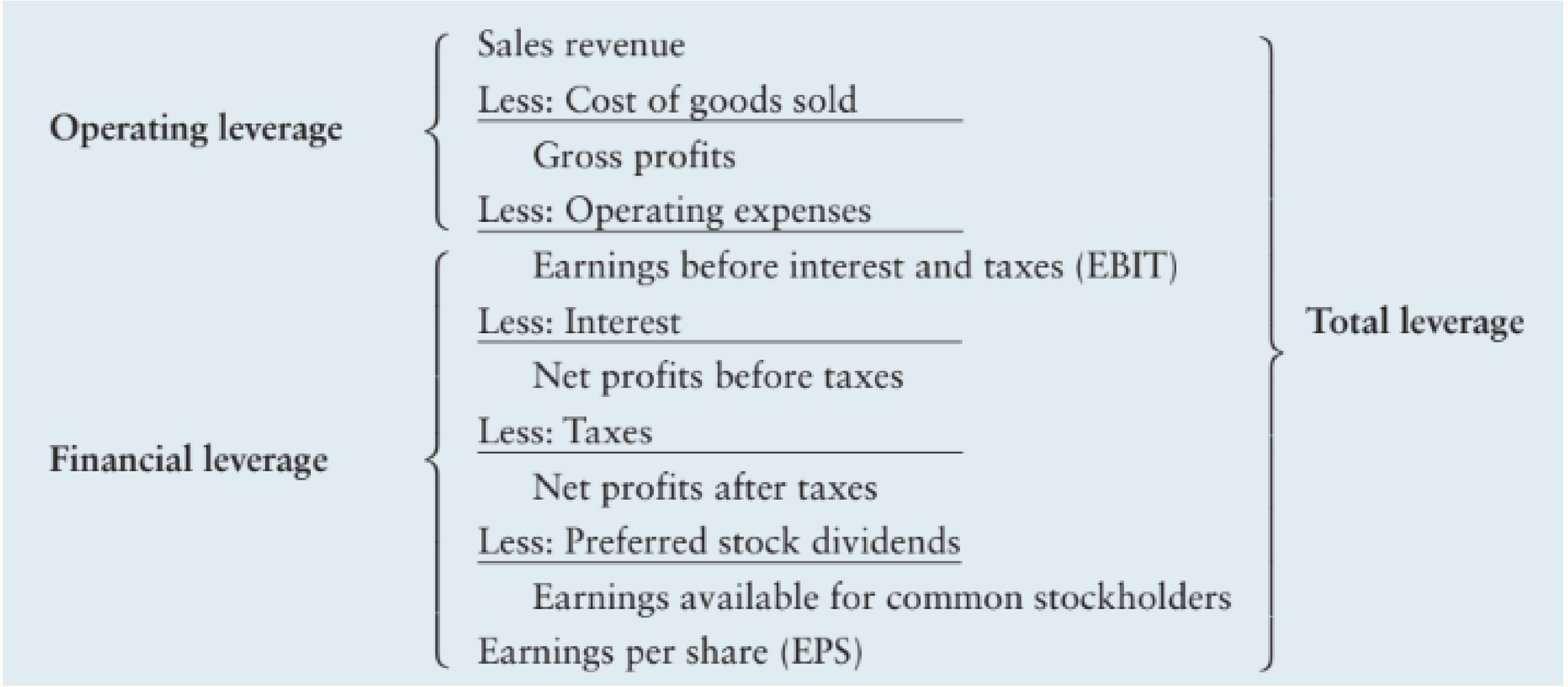
TYPES OF LEVERAGE

Operating leverage (OL)
is fixed costs associated with running the firm. OL is concerned with the relationship between the firm’s revenue and its earnings before interest and taxes (EBIT).

Financial leverage (FL)
is fixed costs associated with financing the firm. FL concerned with the relationship between the firm’s EBIT and its common stock earnings per share (EPS)

Total leverage (TL)
is concerned with the relationship between the firm’s sales revenue and EPS

GENERAL INCOME STATEMENT FORMAT AND TYPES OF LEVERAGE



OPERATING VS. FINANCIAL LEVERAGE

Operating leverage (OL)

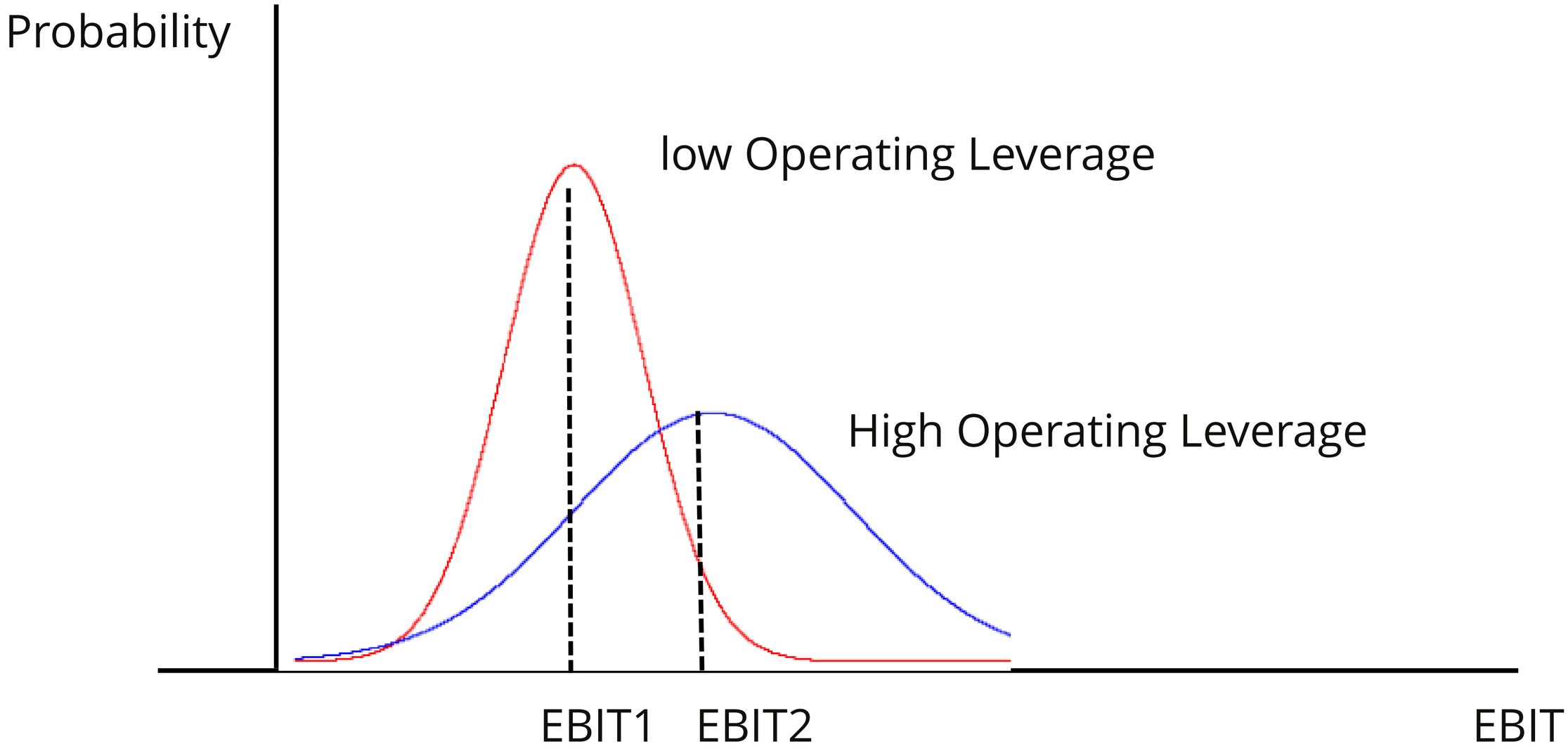
- Operating leverage is concerned with investment activities of the firm.
- It is determined by the cost structure of the firm. Involves relative use of fixed and variable costs
- It is the firm's ability to use fixed operating costs to magnify the effects of changes in sales on its earnings before interest and taxes.
- The higher the proportion of fixed operating costs to the total operating costs in the cost structure of a firm, the higher is the degree of operating leverage.
- Degree of operating leverage enables us to measure the business risk associated with the firm.
- Operating leverage has an influence on a firm's business risk

Financial leverage (OL)

- Financial leverage is concerned with financing activities of the firm.
- It is determined by the capital structure of the firm.
- It is the firm's ability to use fixed financial charges to magnify the effects of changes in EBIT on its earnings per share.
- The higher the proportion of fixe charges bearing capital to total financial changes in the capital structure of a firm, the higher is the degrees of financial leverage.
- Degree of financial leverage enables us to measure the degree of financial risk, associated with the firm.

THE EFFECT OF OPERATING LEVERAGE

- Operating leverage is the use of fixed costs rather than variable costs.
- If most costs are fixed, hence do not decline when demand falls, then the firm has high operating leverage.
- More operating leverage leads to more business risk, for then a small sales decline causes a big profit decline.
- Can use operating leverage to get higher, but risk also increases


Probability
low Operating Leverage
High Operating Leverage
EBIT1
EBIT2
EBIT

THE EFFECT OF FINANCIAL LEVERAGE

- A firm is said to be leveraged if it has fixed cost.
- The use of sources of finance with a fixed cost, such as debt and preference share capital, to finance the assets of the company is known as financial leverage
- The amount of leverage in a firm's capital structure (the mix of long-term debt and equity maintained by the firm) can significantly affect its value by affecting return and risk
- The more debt financing a firm uses in its capital structure, the more financial leverage it employs.
- Variability of EPS and ROE is much larger under the proposed capital structure with debts, more risk.

REDEFINING RISK FOR LEVERAGE-RELATED ISSUES

Leverage-related risk is variation in ROE and EPS

- Business risk—Uncertainty about future operating income (EBIT)
  —variation in EBIT
  —business risk does not include financing effects.

  What determines business risk?
  Uncertainty about demand (sales).
  Uncertainty about output prices.
  Uncrtainty about costs.
  Product, other types of liability.
  Operating leverage.

REDEFINING RISK FOR LEVERAGE-RELATED ISSUES

- Financial risk
  —additional variation in ROE and EPS
  —Financial risk depends only on the tipes of securities issued,
  More debt, more financial risk

How does leverage affect the EPS and ROE of a firm?

FINANCIAL LEVERAGE, EPS, AND ROE

- Financial leverage refers to using borrowedmoney to enhance the effectiveness of invested equity
- The effect of financial leverage depends on the companys EBIT. When EBIT is relatively high, leverage is beneficial.
- When we increase the amount of debt financing, we increase the fixed interest expense
- If we have a really good year, then we pay our fixed cost and we have more left over for our stockholders
- If we have a really bad year, we still have to pay our fixed costs and we have less left over for our stockholders
- Leverage amplifies the variation in both EPS and ROE

What happens to EPS and ROE when Company issue debt and buy back shares of stock?

we will ignore the effect of taxes at this stage

PT.Abadi Jaya	Current	Proposed
Asset	IDR.20.000.000	IDR.20.000.000
Debt	IDR.0	IDR. 8.000.000
Equity	IDR.20.000.000	IDR. 12.000.000
Debt/Equity Ratio	0.00	0.67
Share Price	IDR.50	IDR.50
Shares outstanding	400.000	240.000
Interest Rate	N/A	8%/year

Measures of performance

- **Operating income** - EBIT or Earnings Before Interest andTaxes).
- **Return on Equity (ROE)** is Earnings after Taxes: Stockholders'Equity
- **Earnings per Share (EPS)** is Earnings after Taxes□number ofshares. Investors regard EPS as an important indicator of future profitability

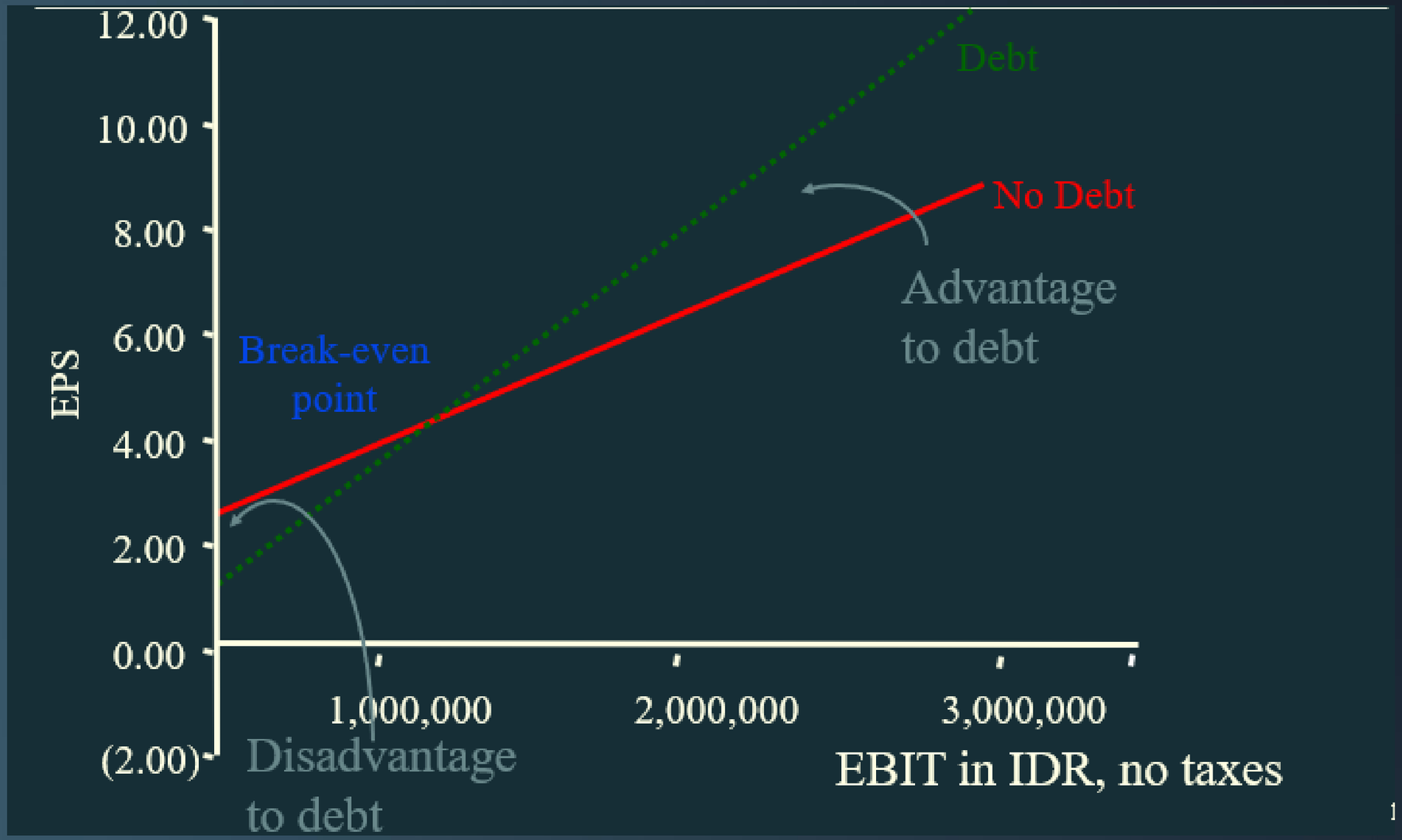
EPS and ROE Under Current Structure

	Recession	Expected	Expansion
EBIT	IDR 1,000,000.00	IDR 2,000,000.00	IDR 3,000,000.00
Interest	0	0	0
Net income	IDR 1,000,000.00	IDR 2,000,000.00	IDR 3,000,000.00
EPS	IDR 2.50	IDR 5.00	IDR 7.50
ROA	5.00%	10.00%	15.00%
ROE	5.00%	10.00%	15.00%
Current Shares Outstanding = 400000 shares			

EPS and ROE Under Proposed Structure

	Recession	Expected	Expansion
EBIT	IDR 1,000,000.00	IDR 2,000,000.00	IDR 3,000,000.00
Interest	IDR 640,000.00	IDR 640,000.00	IDR 640,000.00
Net income	IDR 360,000.00	IDR 1,360,000.00	IDR 2,360,000.00
EPS	IDR 1.50	IDR 5.67	IDR 9.83
ROA	1.80%	6.80%	11.80%
ROE	0.30%	11.33%	19.67%
Proposed Shares Outstanding = 240000 shares			

Financial Leverage and EPS



The firm borrows IDR 8 juta and buys back 160 shares at IDR.50 per share.

Variability in ROE & EPS

Variability in ROE

- Current: ROE ranges from 5% - 15%
- Proposed : ROE ranges from 0.3% - 19.67%

Variability in EPS

- Current: EPS ranges from IDR 2.5 - IDR 7.5
- Proposed : EPS ranges from IDR 1.5 - IDR 9.83

The variability in both ROE and EPS increases when financial leverage is increased

Total Cash Flow to Investors

	Recession	Expected	Expansion
EBIT	IDR 1,000,000.00	IDR 2,000,000.00	IDR 3,000,000.00
Interest	0	0	0
EBT	IDR 1,000,000.00	IDR 2,000,000.00	IDR 3,000,000.00
Taxes (*T*c = 35%)	IDR 350,000.00	IDR 700,000.00	IDR 1,050,000.00
Total Cash Flow to S/H	IDR 650,000.00	IDR 1,300,000.00	IDR 1,950,000.00

	Recession	Expected	Expansion
EBIT	IDR 1,000,000.00	IDR 2,000,000.00	IDR 3,000,000.00
Interest (IDR.8000.000 @ 8%)	IDR 640,000.00	IDR 640,000.00	IDR 640,000.00
EBT	IDR 360,000.00	IDR 1,360,000.00	IDR 2,360,000.00
Taxes (*Tc* = 35%)	IDR 126,000.00	IDR 476,000.00	IDR 826,000.00
	IDR 234,000.00	IDR 884,000.00	IDR 1,534,000.00
Total Cash Flow	IDR 234.000+640.000	IDR.884.000+640.000	IDR.1,534+640.000
(to both S/H & B/H):	IDR 874,000.00	IDR 1,524,000.00	IDR 2,174,000.00
EBIT(1-Tc)+T $_C$R $_B$B	IDR.650.000+224.000	IDR.1,300.000+224.000	IDR.1,950,000+224.000
	IDR 874,000.00	IDR 1,524,000.00	IDR 2,174,000.00

BREAKEVEN ANALYSIS

Also called cost-volume-profit analysis

It is used

- to determine the level of operations necessary to cover all costs
- to evaluate the profitability associated with various levels of sales

The firm's operating breakeven point is the level of sales necessary to cover all operating costs.earnings before interest and taxes (EBIT) equals 0

Cost of goods sold and operating expenses are divided into:

- Fixed costs are a function of time, not sales volume and are typically contractual
- Variable costs vary directly with sales and are a function of volume, not time

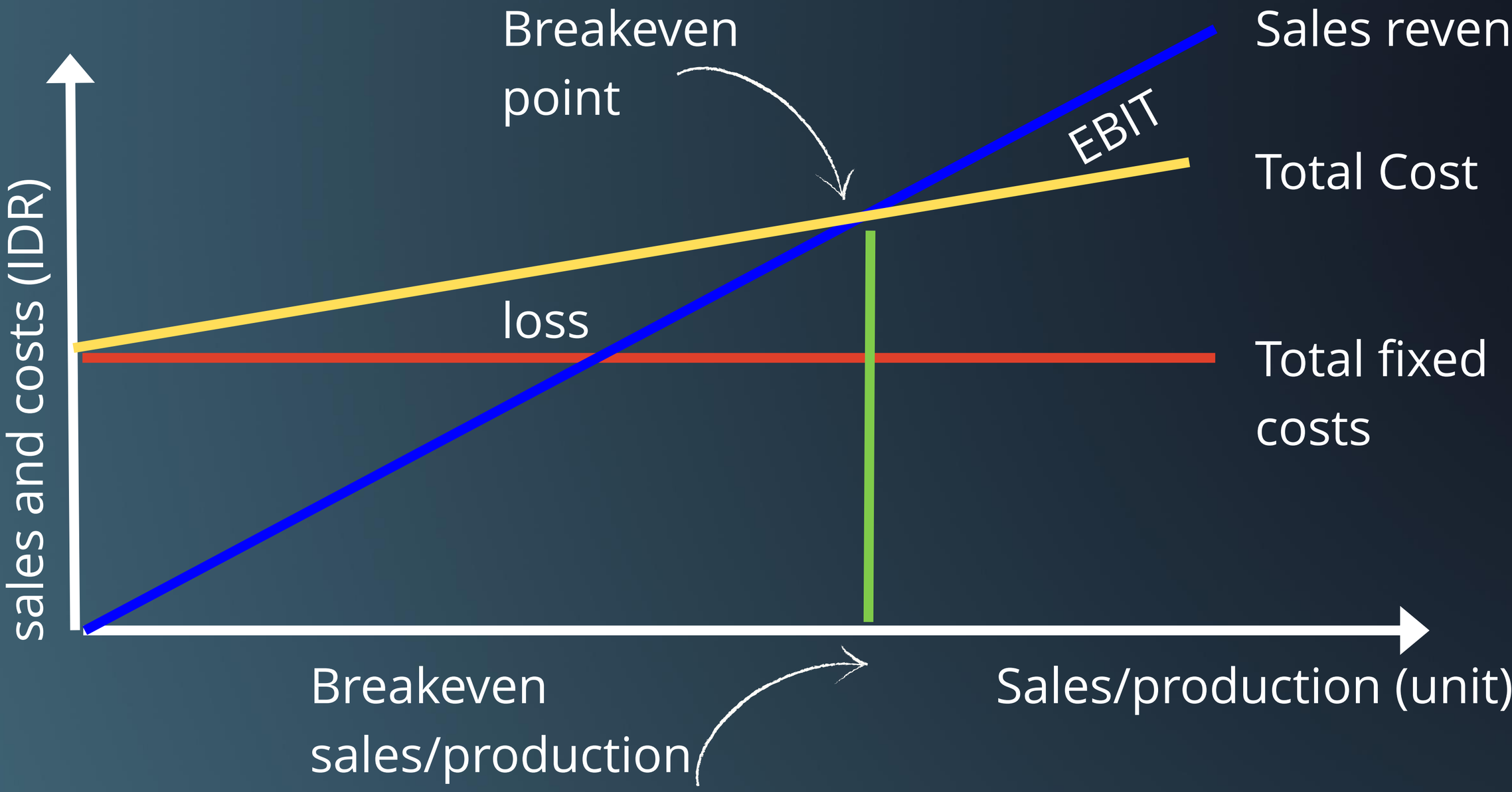
BREAKEVEN ANALYSIS

• Sales revenue	P x Q
• Less: fixed operating costs	FC
• Less: variable operating costs	VC x Q
• Earnings before interest and taxes	EBIT

EBIT = (P x Q) – FC – (VC x Q) simplify EBIT= Q (P - VC) - FC

Break-even quantity (Q)= $\frac{FC}{P-VC}$

BREAKEVEN ANALYSIS



EXAMPLE

Modern Inc. is currently selling a product at IDR 1000 per unit. It has VC of IDR. 500 per unit and FC of IDR. 200,000.

	300 Unit	400 Unit	500 Unit	600 Unit
Revenue	300,000	400,000	500,000	600,000
Variabel cost	150,000	200,000	250,000	300,000
Fixed Cost	200,000	200,000	200,000	200,000
EBIT	(50,000)	-	50,000	100,000

The sensitivity of EBIT to changes in unit sales is referred to as the degree of operating leverage

EXAMPLE

Assume that Modern Inc wishes to evaluate the impact of several options:
(1) increasing fixed operating costs to 300,000, (2) increasing the sale price per unit to IDR 1250, (3) increasing the variable operating cost per unit to IDR.750, and (4) simultaneously implementing all three of these changes.

Operating breakeven point = IDR.300.000 /(1000-300) = 600

Operating breakeven point = IDR.200.000 /(1250-500) = 267

Operating breakeven point = IDR.200.000 /(1000-750) =800

Operating breakeven point = IDR.300.000 /(1250-750) =600

breakeven points to the initial value of 400 units,the cost increases (actions 1 and 3) raise the breakeven point, whereas the revenue increase (action 2) lowers the breakeven point. The combined effect of increasing all three variables (action 4) also results in an increased operating breakeven point

THE SENSITIVITY OF THE BREAKEVEN

Increase in variable	Effect on operating breakeven point
Fixed operating cost (FC)	Increase
Sale price per unit (P)	Decrease
Variable operating cost per unit (VC)	Increase

OPERATING LEVERAGE

- Operating leverage results from the existence of fixed costs that the firm must pay to operate.
- The use of fixed operating costs to magnify the effects of changes in sales on the firm's earnings before interest and taxes.
- DOL is the numerical measure of the firm's operating leverage
- As long as DOI is greater than 1, there is operating leverage
- An increase in sales results in a more-than-proportional increase in EBIT; a decrease in sales results in a more-than-proportional decrease in EBIT.

$$DOL = \frac{\%\ \text{Change in EBIT}}{\%\ \text{Change in Sales}}$$

$$\text{DOL at base sale level (Q)} = \frac{Q\ X\ (P\text{-}VC)}{Q\ X\ (P\text{-}VC)\text{-}FV}$$

$$\text{DOL at base dollar sales TR} = \frac{TR\text{-}TVC}{TR\text{-}TVC\text{-}FC}$$

OPERATING LEVERAGE

	Case 2		Case 1
	−50%		+50%
Sales (in units)	500	1,000	1,500
Sales revenue[a]	$5,000	$10,000	$15,000
Less: Variable operating costs[b]	2,500	5,000	7,500
Less: Fixed operating costs	2,500	2,500	2,500
Earnings before interest and taxes (EBIT)	$ 0	$ 2,500	$ 5,000
	−100%		+100%

[a]Sales revenue = $10/unit × sales in units.

[b]Variable operating costs = $5/unit × sales in units.

DOL 1 = 2

$$\frac{100\%}{50\%}$$

DOL 2 = 2

$$\frac{-100\%}{-50\%}$$

EXAMPLE 2

Modern Inc. Data: sales in quantity Q = 1,000, P = IDR.100, VC = IDR.50, and FC = IDR.25.000

$$\text{DOL at base sales level (Q)} = \frac{Q \text{ X } (P\text{-}VC)}{Q \text{ X } (P\text{-}VC\text{-}FV}$$

$$\text{DOL at base sales level (Q)} = \frac{1000 \text{ X } (100\text{-}50)}{1000 \text{ X } (100\text{-}50)\text{-}25.000} = 2$$

the DOL value of 2.0 means that at Modern Inc. a change in sales volume results in an EBIT change that is twice as large in percentage

FIXED COSTS AND OPERATING LEVERAGE

- Changes in fixed operating costs affect operating leverage significantly.
- the firm has increased its operating leverage by increasing fixed costs and lowering variable costs.
- The higher the firm's fixed operating costs relative to variable operating costs, the greater the degree of operating leverage.

Modern Inc. eliminates commissions and increases salaries.This exchange results in a reduction in he variable cost per unit from IDR.50 to IDR.40 and an increase in the fixed costs from IDR.25000 to IDR. 30000. Although the EBIT of IDR.25,000 at the 1,000-unit sales level is the same as before the shift in cost structure,

$$\text{DOL at 1,000 units} = \frac{1000 \times (100-45)}{1000 \times (100-45) - 30.000} = 55.000/25.000 = 2.2$$

EXAMPLE 4

The company Modern Inc. has fixed expenses: IDR.300,000, Tax rate: 50%, Outstanding shares: 100,000

EBIT	400,000	500,000	600,000	700,000
Interest Expense	300,000	300,000	300,000	300,000
Profit before taxes	100,000	200,000	300,000	400,000
Tax	50,000	100,000	150,000	200,000
Profit after taxes	50,000	100,000	150,000	200,000
EPS	0.50	1.00	1.50	2.00

The sensitivity of profit before tax to changes in EBIT is referred to as the degree of financial leverage

FINANCIAL LEVERAGE

- Financial leverage results from the presence of fixed financial costs that the firm must pay.
- the use of fixed financial costs to magnify the effects of changes in earnings before interest and taxes on the firm's earnings per share.
- The two most common fixed financial costs are (1) interest on debt and (2) preferred stock dividends.
- When DFL is greater than 1, there is financial leverage.

$$DFL = \frac{\%\ \text{Change in EPS}}{\%\ \text{Change in EBIT}}$$

$$\text{DFL at base level EBIT} = \frac{\text{EBIT}}{\text{EBIT-I - (PD X 1/(1-T))}}$$

FINANCIAL LEVERAGE

	Case 2		Case 1	
		−40%		+40%
EBIT	$6,000		$10,000	$14,000
Less: Interest (I)	2,000		2,000	2,000
Net profits before taxes	$4,000		$ 8,000	$12,000
Less: Taxes (T = 0.40)	1,600		3,200	4,800
Net profits after taxes	$2,400		$ 4,800	$ 7,200
Less: Preferred stock dividends (PD)	2,400		2,400	2,400
Earnings available for common (EAC)	$ 0		$ 2,400	$ 4,800
Earnings per share (EPS)	$\frac{\$0}{1{,}000} = \$0$		$\frac{\$2{,}400}{1{,}000} = \$2.40$	$\frac{\$4{,}800}{1{,}000} = \$4.80$
		−100%		+100%

[a]As noted in Chapter 2, for accounting and tax purposes, interest is a *tax-deductible expense*, whereas dividends must be paid from after-tax cash flows.

DFL 1 = 2.5

$$\frac{100\%}{40\%}$$

DFL 2 = 2.5

$$\frac{-100\%}{-40\%}$$

TOTAL LEVERAGE

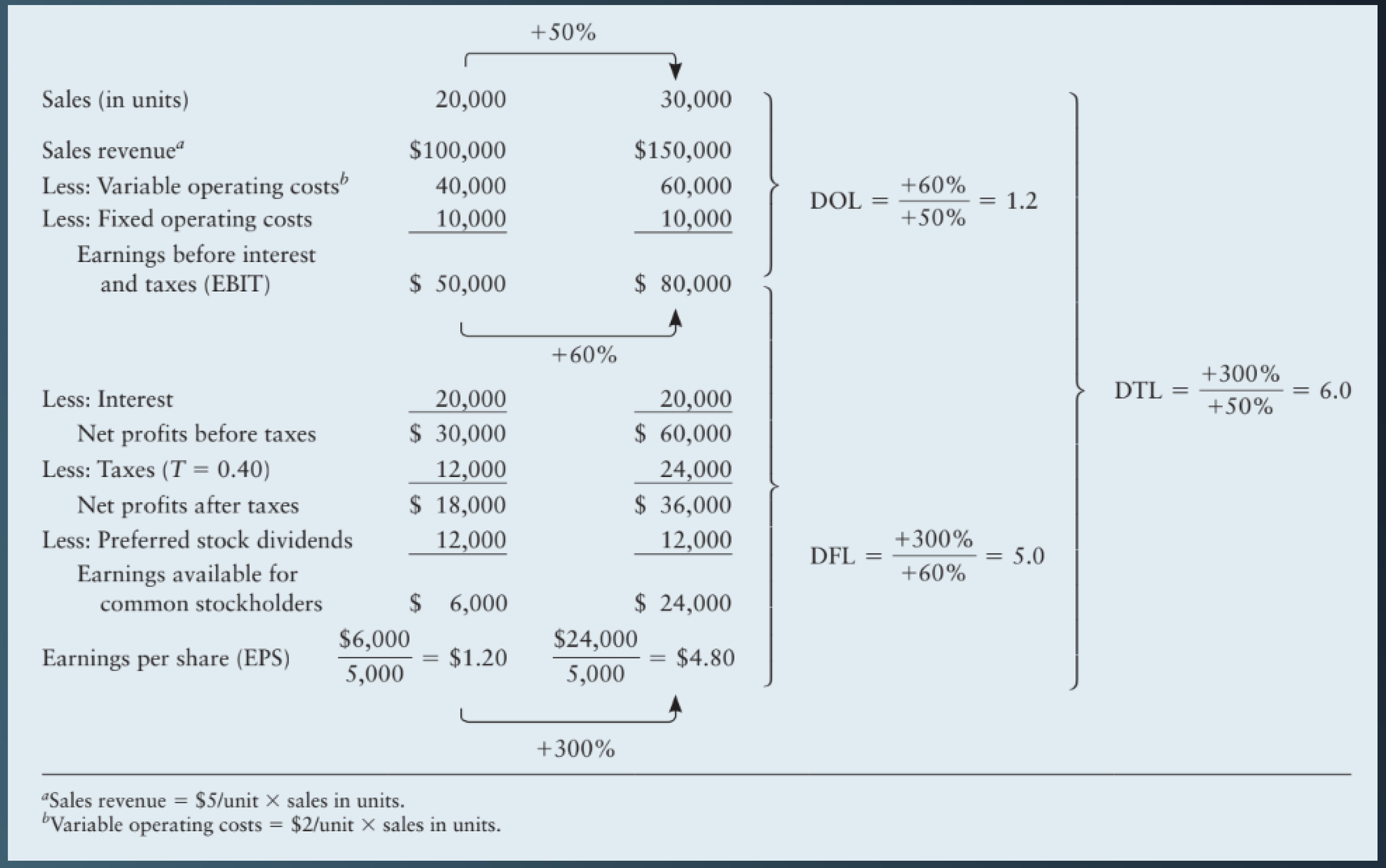
- the use of fixed costs, both operating and financial, to magnify the effects of changes in sales on the firm's earnings per share.
- degree of total leverage (DTL) is a numerical measure of the firm's total leverage.
- The Two components of total leverage are operating and financial leverage

$$DTL = \frac{\%\ \text{Change in EPS}}{\%\ \text{Change in sales}}$$

$$\text{DTL at base sales level Q} = \frac{Q\ X\ (P\text{-}VC)}{Q\ X\ (P\text{-}VC)\text{-}FC\text{-}I\text{-}\ (PD\ x(1/1\text{-}T))}$$

$$DTL = DOL\ X\ DFL$$

TOTAL LEVERAGE

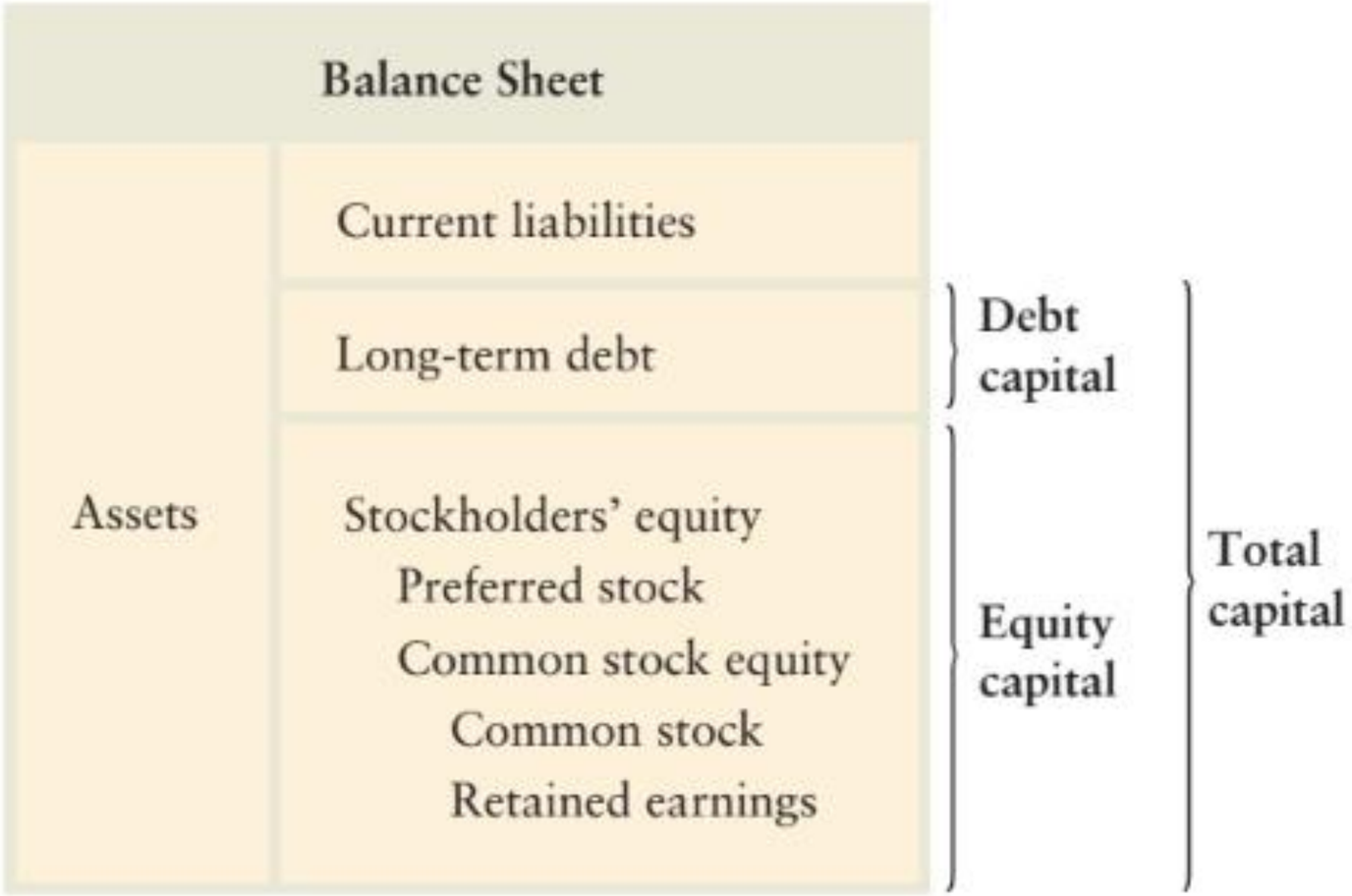


[a]Sales revenue = $5/unit × sales in units.
[b]Variable operating costs = $2/unit × sales in units.

CAPITAL STRUCTURE

- The mix of long-term financial sources used to finance firm
- it usually refers to the spesific proportions of debt , equity, prefered stock, etc. used to finance the firm
- The two main sourcesof equity capital are (1) preferred stock and (2) common stock equity, which includes common stock and retained earnings. Common stock is typically the most expensive form of equity, followed by retained earnings and then preferred stock.

TYPES OF CAPITAL



- The cost of debt is lower than the cost of other forms of financing.
- Lenders demand relatively lower returns because they take the least risk of any contributors of long-term capital

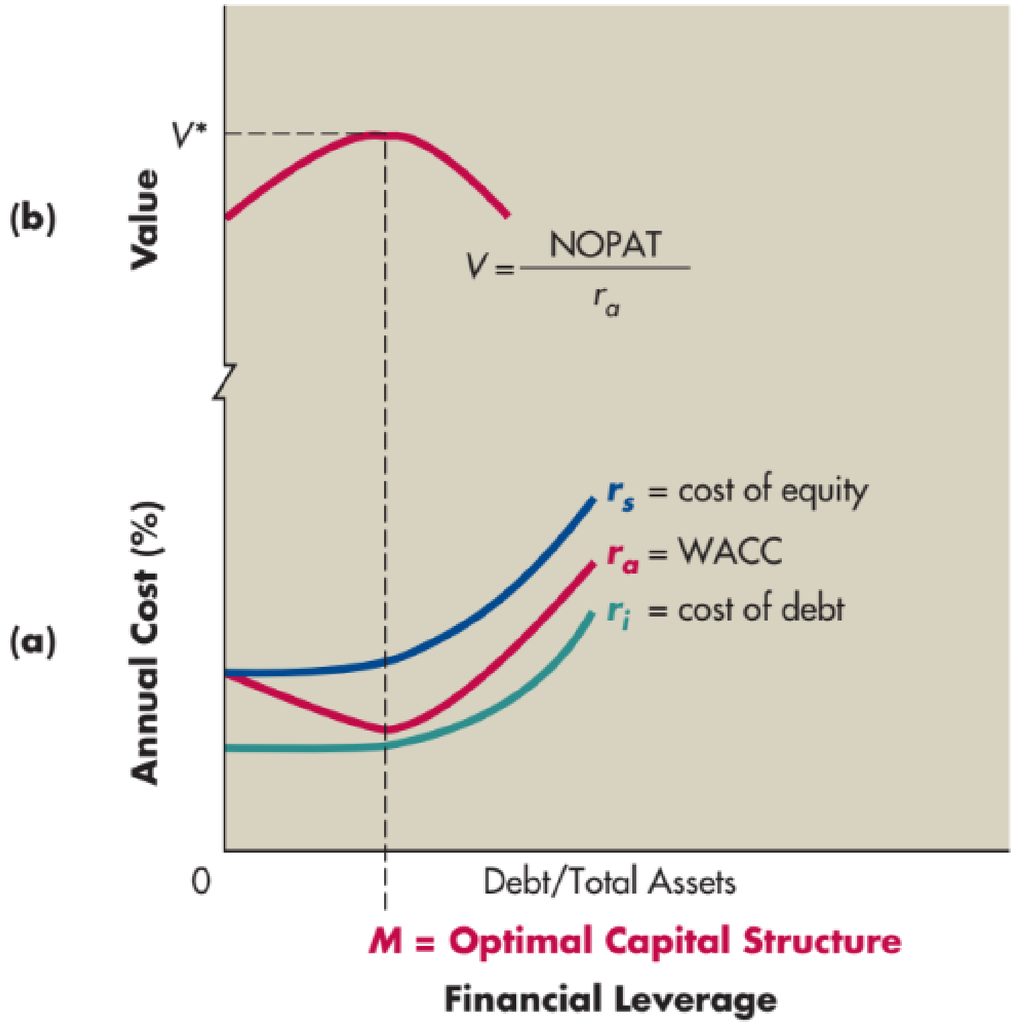
CAPITAL STRUCTURE

- only long-term sources are included
- From leverage analysis, we know that adding debt adds risk
- Adding debt will increase its cost, and the cost of equity
- The goal of financial manager is to maximize the shareholder wealth.
- What Level of debt will maximize the value of the firm to the shareholder?

THE OPTIMAL DEBT LEVEL DEPENDS ON:

- Tax Benefits
- Probability of Bankruptcy
    - Business Risk
    - Revenue stability
    - Cost stability
    - Level of fixed operating costs
    - Agency Costs Imposed by Lenders
    - Pecking order theory (issue more debt, common equity)
    - Signaling (asymetric information)

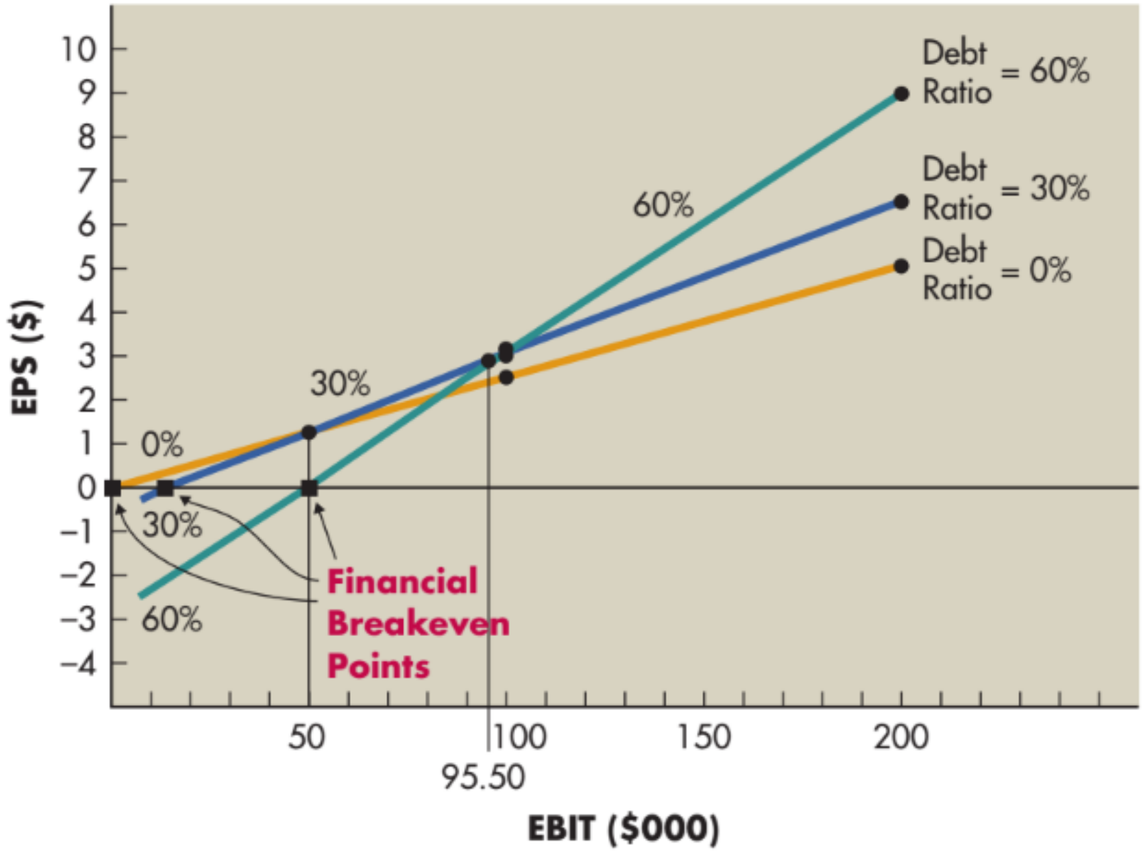
THE OPTIMAL CAPITAL STRUCTURE



EBIT–EPS APPROACH TO CAPITAL STRUCTURE

- An approach for selecting the capital structure that maximizes earnings per share (EPS) over the expected range of earnings before interest and taxes (EBIT).
- using this approach, the emphasis is on maximazing the owners return (EPS)
- This method does not explicitly consider the impact of risk

EBIT–EPS APPROACH TO CAPITAL STRUCTURE



Capital structure debt ratio	EBIT	
	$100,000	$200,000
	Earnings per share (EPS)	
0%	$2.40	$4.80
30	2.91	6.34
60	3.03	9.03

CHOOSING THE OPTIMAL CAPITAL STRUCTURE

Required Returns for Cooke Company's Alternative Capital Structures

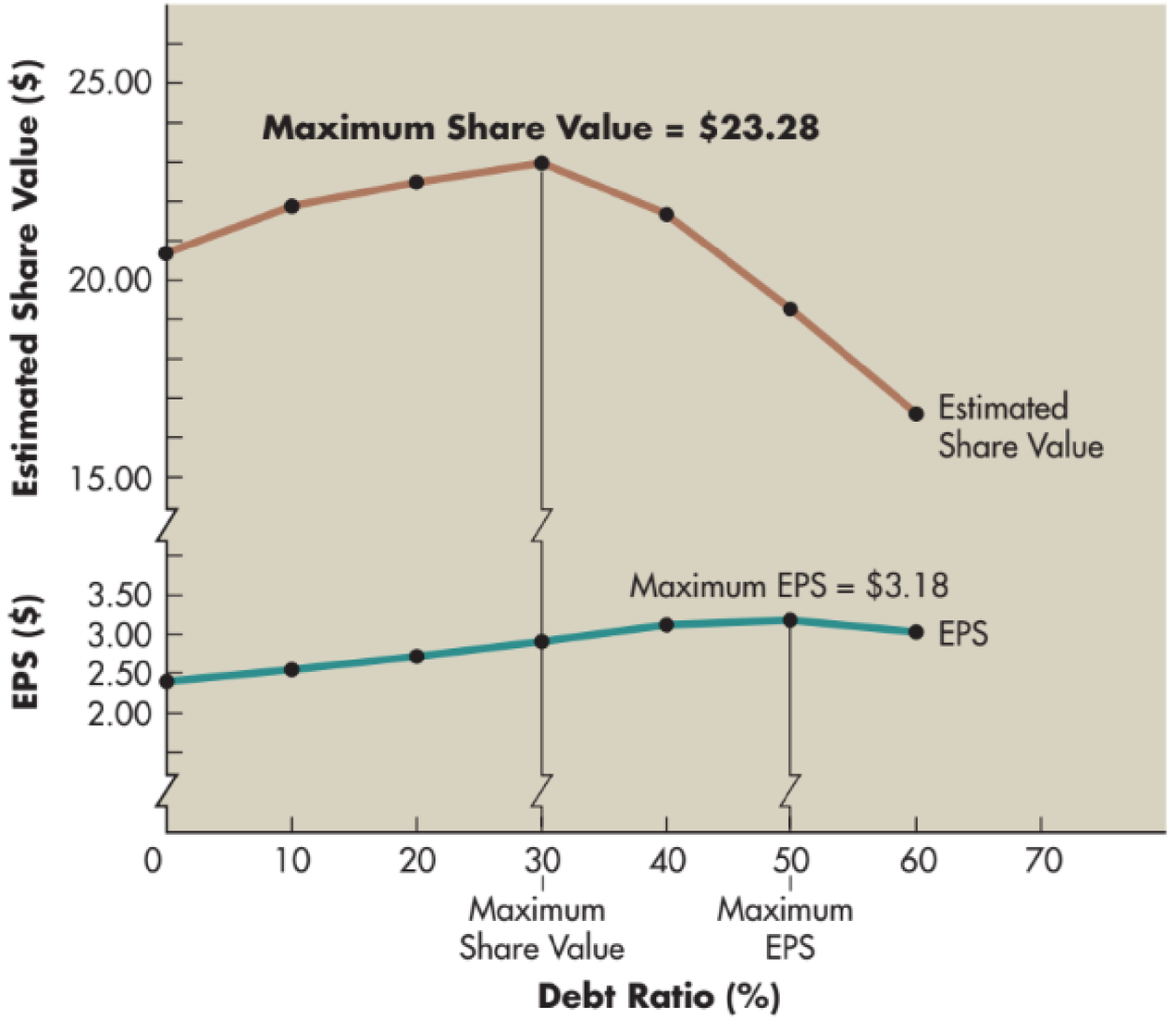
Capital structure debt ratio	Coefficient of variation of EPS (from column 3 of Table 13.13) (1)	Estimated required return, r_s (2)
0%	0.71	11.5%
10	0.74	11.7
20	0.78	12.1
30	0.83	12.5
40	0.91	14.0
50	1.07	16.5
60	1.40	19.0

CHOOSING THE OPTIMAL CAPITAL STRUCTURE

Calculation of Share Value Estimates Associated with Alternative Capital Structures for Cooke Company

Capital structure debt ratio	Expected EPS (from column 1 of Table 13.13) (1)	Estimated required return, r_s (from column 2 of Table 13.14) (2)	Estimated share value [(1) ÷ (2)] (3)
0%	$2.40	0.115	$20.87
10	2.55	0.117	21.79
20	2.72	0.121	22.48
30	2.91	0.125	23.28
40	3.12	0.140	22.29
50	3.18	0.165	19.27
60	3.03	0.190	15.95

CHOOSING THE OPTIMAL CAPITAL STRUCTURE




thank
you