■ Solutions to Problems

P11-1. LG 1: Breakeven point–algebraic

Basic

$$Q = \frac{\text{FC}}{(P - \text{VC})}$$

$$Q = \frac{\$12,350}{(\$24.95 - \$15.45)} = 1,300$$

P11-2. LG 1: Breakeven comparisons–algebraic

Basic

a. $Q = \dfrac{\text{FC}}{(P - \text{VC})}$

Firm F: $Q = \dfrac{\$45,000}{(\$18.00 - \$6.75)} = 4,000 \text{ units}$

Firm G: $Q = \dfrac{\$30,000}{(\$21.00 - \$13.50)} = 4,000 \text{ units}$

Firm H: $Q = \dfrac{\$90,000}{(\$30.00 - \$12.00)} = 5,000 \text{ units}$

b. From least risky to most risky: F and G are of equal risk, then H. It is important to recognize that operating leverage is only one measure of risk.

P11-3. LG 1: Breakeven point–algebraic and graphical

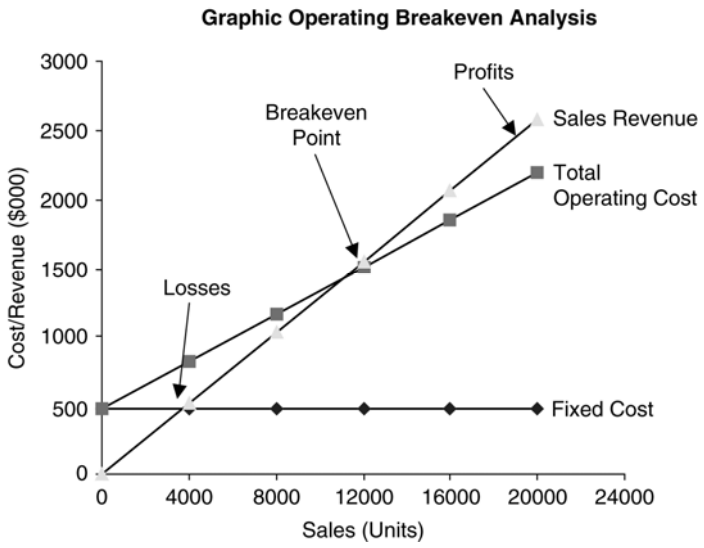
Intermediate

a. $Q = \text{FC} \div (P - \text{VC})$

$Q = \$473{,}000 \div (\$129 - \$86)$

$Q = 11{,}000$ units

b.



P11-4. LG 1: Breakeven analysis

Intermediate

a. $Q = \dfrac{\$73{,}500}{(\$13.98 - \$10.48)} = 21{,}000$ CDs

b. Total operating costs = FC + ($Q \times$ VC)

Total operating costs = \$73,500 + (21,000 × \$10.48)

Total operating costs = \$293,580

c. 2,000 × 12 = 24,000 CDs per year. 2,000 records per month exceeds the operating breakeven by 3,000 records per year. Barry should go into the CD business.

d. EBIT = ($P \times Q$) – FC – (VC × Q)

EBIT = (\$13.98 × 24,000) – \$73,500 – (\$10.48 × 24,000)

EBIT = \$335,520 – \$73,500 – \$251,520

EBIT = \$10,500

P11-5. LG 1: Breakeven analysis

Easy

a. Break even point in months = fixed cost ÷ (monthly benefit – monthly variable costs)
\$500 ÷ (\$35 – \$20) = \$500 ÷ \$15 = 33 1/3 months

b. Install the Geo-Tracker because the device pays for itself over 33.3 months, which is less than the 36 months that Paul is planning on owning the car.

P11-6. LG 1: Breakeven point–changing costs/revenues

Intermediate

a. $Q = F \div (P - \text{VC})$ $Q = \$40{,}000 \div (\$10 - \$8) = 20{,}000$ books

b. $Q = \$44{,}000 \div \$2.00 = 22{,}000$ books

c. $Q = \$40{,}000 \div \$2.50 = 16{,}000$ books

d. $Q = \$40{,}000 \div \$1.50 = 26{,}667$ books

e. The operating breakeven point is directly related to fixed and variable costs and inversely related to selling price. Increases in costs raise the operating breakeven point, while increases in price lower it.

P11-7. LG 2: EBIT sensitivity

Intermediate

a. and b.

	8,000 Units	**10,000 Units**	**12,000 Units**
Sales	\$72,000	\$90,000	\$108,000
Less: Variable costs	40,000	50,000	60,000
Less: Fixed costs	20,000	20,000	20,000
EBIT	\$12,000	\$20,000	\$ 28,000

c.

Unit Sales	**8,000**	**10,000**	**12,000**
Percentage Change in unit sales	(8,000 – 10,000) ÷ 10,000 = –20%	0	(12,000 – 10,000) ÷ 10,000 = +20%
Percentage Change in EBIT	(12,000 – 20,000) ÷ 20,000 = –40%	0	(28,000 – 20,000) ÷ 20,000 = + 40%

d. EBIT is more sensitive to changing sales levels; it increases/decreases twice as much as sales.

P11-8. LG 2: DOL

Intermediate

a. $Q = \dfrac{\text{FC}}{(P - \text{VC})} = \dfrac{\$380{,}000}{\$63.50 - \$16.00} = 8{,}000$ units

b.

	9,000 Units	**10,000 Units**	**11,000 Units**
Sales	\$571,500	\$635,000	\$698,500
Less: Variable costs	144,000	160,000	176,000
Less: Fixed costs	380,000	380,000	380,000
EBIT	\$ 47,500	\$ 95,000	\$142,500

c.

Change in unit sales	–1,000	0	+1,000
% change in sales	–1,000 ÷ 10,000 = –10%	0	1,000 ÷ 10,000 = +10%
Change in EBIT	–$47,500	0	+$47,500
% Change in EBIT	–$47,500 ÷ 95,000 = –50%	0	$47,500 ÷ 95,000 = +50%

d.

$\frac{\text{\% change in EBIT}}{\text{\% change in sales}}$	–50 ÷ –10 = 5	50 ÷ 10 = 5

e. $$\text{DOL} = \frac{[Q \times (P - \text{VC})]}{[Q \times (P - \text{VC})] - \text{FC}}$$

$$\text{DOL} = \frac{[10{,}000 \times (\$63.50 - \$16.00)]}{[10{,}000 \times (\$63.50 - \$16.00) - \$380{,}000]}$$

$$\text{DOL} = \frac{\$475{,}000}{\$95{,}000} = 5.00$$

P11-9. LG 2: DOL–graphic

Intermediate

a. $$Q = \frac{\text{FC}}{(P - \text{VC})} = \frac{\$72{,}000}{\$9.75 - \$6.75} = 24{,}000 \text{ units}$$

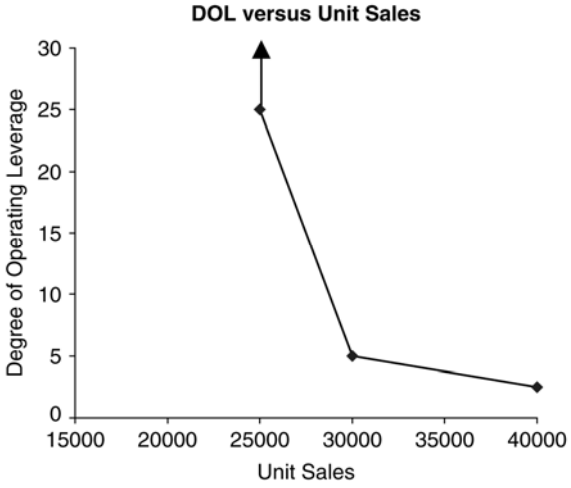
b. $$\text{DOL} = \frac{[Q \times (P - \text{VC})]}{[Q \times (P - \text{VC})] - \text{FC}}$$

$$\text{DOL} = \frac{[25{,}000 \times (\$9.75 - \$6.75)]}{[25{,}000 \times (\$9.75 - \$6.75)] - \$72{,}000} = 25.0$$

$$\text{DOL} = \frac{[30{,}000 \times (\$9.75 - \$6.75)]}{[30{,}000 \times (\$9.75 - \$6.75)] - \$72{,}000} = 5.0$$

$$\text{DOL} = \frac{[40{,}000 \times (\$9.75 - \$6.75)]}{[40{,}000 \times (\$9.75 - \$6.75)] - \$72{,}000} = 2.5$$

c.



d. $$\text{DOL} = \frac{[24{,}000 \times (\$9.75 - \$6.75)]}{[24{,}000 \times (\$9.75 - \$6.75)] - \$72{,}000} = \infty$$

At the operating breakeven point, the DOL is infinite.

e. DOL decreases as the firm expands beyond the operating breakeven point.

P11-10. LG 2: EPS calculations

Intermediate

	(a)	(b)	(c)
EBIT	$24,600	$30,600	$35,000
Less: Interest	9,600	9,600	9,600
Net profits before taxes	$15,000	$21,000	$25,400
Less: Taxes	6,000	8,400	10,160
Net profit after taxes	$ 9,000	$12,600	$15,240
Less: Preferred dividends	7,500	7,500	7,500
Earnings available to common shareholders	$ 1,500	$ 5,100	$ 7,740
EPS (4,000 shares)	$ 0.375	$ 1.275	$ 1.935

P11-11. LG 2: DFL

Intermediate

a.

EBIT	$80,000	$120,000
Less: Interest	40,000	40,000
Net profits before taxes	$40,000	$ 80,000
Less: Taxes (40%)	16,000	32,000
Net profit after taxes	$24,000	$ 48,000
EPS (2,000 shares)	$ 12.00	$ 24.00

b. $$\text{DFL} = \frac{\text{EBIT}}{\left[\text{EBIT} - I - \left(\text{PD} \times \frac{1}{(1-T)}\right)\right]}$$

$$\text{DFL} = \frac{\$80{,}000}{[\$80{,}000 - \$40{,}000 - 0]} = 2$$

c.

EBIT	$80,000	$120,000
Less: Interest	16,000	16,000
Net profits before taxes	$64,000	$104,000
Less: Taxes (40%)	25,600	41,600
Net profit after taxes	$38,400	$ 62,400
EPS (3,000 shares)	$ 12.80	$ 20.80

$$\text{DFL} = \frac{\$80{,}000}{[\$80{,}000 - \$16{,}000 - 0]} = 1.25$$

P11-12. LG 2: Financial leverage

Challenge

a.

Current DFL	**Initial Values**	**Future Value**	**Percentage Change**
Available for making loan payment	$3,000	$3,300	10.0%
Less: Loan payments	$1,000	$1,000	0.0%
Available after loan payments	$2,000	$2,300	15.0%
DFL			15% ÷ 10% = 1.50

Proposed DFL	**Initial Values**	**Future Value**	**Percentage Change**
Available for making loan payment	$3,000	$3,300	10.0%
Less: Loan payments	$1,350	$1,350	0.0%
Available after loan payments	$1,650	$1,950	18.2%
DFL			18.2% ÷ 10% = 1.82

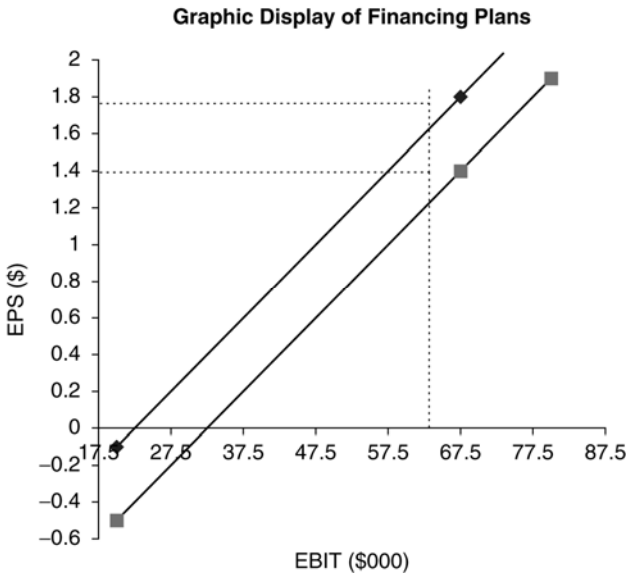
b. Based on his calculations, the amount that Max will have available after loan payments with his current debt changes by 1.5% for every 1% change in the amount he will have available for making the loan payment. This is less responsive and therefore less risky than the 1.82% change in the amount available after making loan payments with the proposed $350 in monthly debt payments. Although it appears that Max can afford the additional loan payments, he must decide if, give the variability of Max's income, he would feel comfortable with the increased financial leverage and risk.

P11-13. LG 2, 5: DFL and graphic display of financing plans—challenge

a. $$\text{DFL} = \frac{\text{EBIT}}{\left[\text{EBIT} - I - \left(\text{PD} \times \frac{1}{(1-T)}\right)\right]}$$

$$\text{DFL} = \frac{\$67,500}{[\$67,500 - \$22,500 - 0]} = 1.5$$

b.



c. $$\text{DFL} = \frac{\$67,500}{\left[\$67,500 - \$22,500 - \frac{\$6,000}{0.6}\right]} = 1.93$$

d. See graph, which is based on the following equation and data points.

Financing	EBIT	EPS
Original financing plan	$67,500	$\frac{(\$67,000 - \$22,500)(1-0.4)}{15,000} = \$1.80$
	$17,500	$\frac{(\$67,000 - \$22,500)(1-0.4)}{15,000} = -\$0.20$
Revised financing plan	$67,500	$\frac{(\$67,000 - \$22,500)(1-0.4) - 6000}{15,000} = \$1.40$
	$17,500	$\frac{(\$17,000 - \$22,500)(1-0.4) - 6000}{15,000} = -\$0.60$

e. The lines representing the two financing plans are parallel since the number of shares of common stock outstanding is the same in each case. The financing plan, including the preferred stock, results in a higher financial breakeven point and a lower EPS at any EBIT level.

P11-14. LG 1, 2: Integrative–multiple leverage measures

Intermediate

a. $$\text{Operating breakeven} = \frac{\$28,000}{\$0.16} = 175,000 \text{ units}$$

b. $$\text{DOL} = \frac{[Q \times (P - \text{VC})]}{[Q \times (P - \text{VC})] - \text{FC}}$$

$$\text{DOL} = \frac{[400,000 \times (\$1.00 - \$0.84)]}{[400,000 \times (\$1.00 - \$0.84)] - \$28,000} = \frac{\$64,000}{\$36,000} = 1.78$$

c. EBIT = $(P \times Q) - \text{FC} - (Q \times \text{VC})$

EBIT = $(\$1.00 \times 400{,}000) - \$28{,}000 - (400{,}000 \times \$0.84)$

EBIT = $\$400{,}000 - \$28{,}000 - \$336{,}000$

EBIT = $\$36{,}000$

$$\text{DFL} = \frac{\text{EBIT}}{\left[\text{EBIT} - I - \left(\text{PD} \times \frac{1}{(1-T)}\right)\right]}$$

$$\text{DFL} = \frac{\$36{,}000}{\left[\$36{,}000 - \$6{,}000 - \left(\frac{\$2{,}000}{(1-0.4)}\right)\right]} = 1.35$$

d. $$\text{DTL}^{*} = \frac{[Q \times (P - \text{VC})]}{\left[Q \times (P - \text{VC}) - \text{FC} - I - \left(\frac{\text{PD}}{(1-T)}\right)\right]}$$

$$\text{DTL} = \frac{[400{,}000 \times (\$1.00 - \$0.84)]}{\left[400{,}000 \times (\$1.00 - \$0.84) - \$28{,}000 - \$6{,}000 - \left(\frac{\$2{,}000}{(1-0.4)}\right)\right]}$$

$$\text{DTL} = \frac{\$64{,}000}{[\$64{,}000 - \$28{,}000 - \$9{,}333]} = \frac{\$64{,}000}{\$26{,}667} = 2.40$$

$\text{DTL} = \text{DOL} \times \text{DFL}$

$\text{DTL} = 1.78 \times 1.35 = 2.40$

The two formulas give the same result.

*Degree of total leverage.

P11-15. LG 2: Integrative–leverage and risk

Intermediate

a. $$\text{DOL}_R = \frac{[100{,}000 \times (\$2.00 - \$1.70)]}{[100{,}000 \times (\$2.00 - \$1.70)] - \$6{,}000} = \frac{\$30{,}000}{\$24{,}000} = 1.25$$

$$\text{DFL}_R = \frac{\$24{,}000}{[\$24{,}000 - \$10{,}000]} = 1.71$$

$$\text{DTL}_R = 1.25 \times 1.71 = 2.14$$

b. $$\text{DOL}_W = \frac{[100{,}000 \times (\$2.50 - \$1.00)]}{[100{,}000 \times (\$2.50 - \$1.00)] - \$62{,}500} = \frac{\$150{,}000}{\$87{,}500} = 1.71$$

$$\text{DFL}_W = \frac{\$87{,}500}{[\$87{,}500 - \$17{,}500]} = 1.25$$

$$\text{DTL}_R = 1.71 \times 1.25 = 2.14$$

c. Firm R has less operating (business) risk but more financial risk than Firm W.

d. Two firms with differing operating and financial structures may be equally leveraged. Since total leverage is the product of operating and financial leverage, each firm may structure itself differently and still have the same amount of total risk.

P11-16. LG 3: Capital structures

Intermediate

a. Monthly mortgage payment ÷ Monthly gross income = \$1,100 ÷ \$4,500 = 24.44%
Kirsten's ratio is less than the bank maximum of 28%.

b. Total monthly installment payment ÷ Monthly gross income = (\$375 + \$1,100) ÷ \$4,500 = 32.8%

Kirsten's ratio is less than the bank maximum of 37.0%. Since Kirsten debt-related expenses as a percentage of her monthly gross income are less than bank-specified maximums, her loan application should be accepted.

P11-17. LG 3: Various capital structures

Basic

Debt Ratio	Debt	Equity
10%	$100,000	$900,000
20%	$200,000	$800,000
30%	$300,000	$700,000
40%	$400,000	$600,000
50%	$500,000	$500,000
60%	$600,000	$400,000
90%	$900,000	$100,000

Theoretically, the debt ratio cannot exceed 100%. Practically, few creditors would extend loans to companies with exceedingly high debt ratios (>70%).

P11-18. LG 5: EBIT-EPS and capital structure

Intermediate

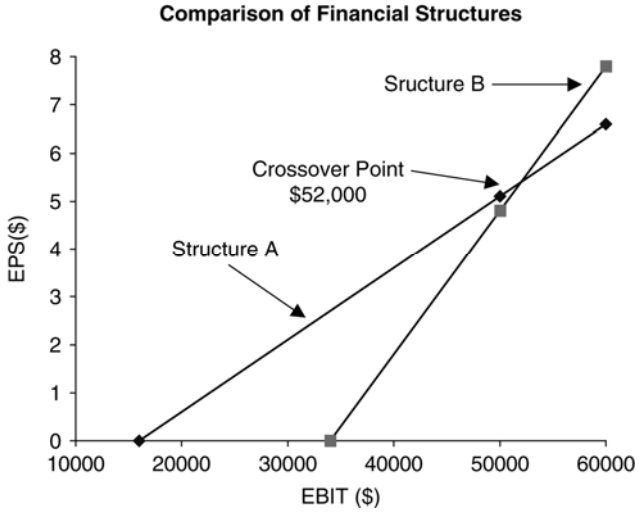
a. Using $50,000 and $60,000 EBIT:

	Structure A		Structure B	
EBIT	$50,000	$60,000	$50,000	$60,000
Less: Interest	16,000	16,000	34,000	34,000
Net profits before taxes	$34,000	$44,000	$16,000	$26,000
Less: Taxes	13,600	17,600	6,400	10,400
Net profit after taxes	$20,400	$26,400	$ 9,600	$15,600
EPS (4,000 shares)	$ 5.10	$ 6.60		
EPS (2,000 shares)			$ 4.80	$ 7.80

Financial breakeven points:

Structure A	Structure B
$16,000	$34,000

b.



c. If EBIT is expected to be below $52,000, Structure A is preferred. If EBIT is expected to be above $52,000, Structure B is preferred.

d. Structure A has less risk and promises lower returns as EBIT increases. B is more risky since it has a higher financial breakeven point. The steeper slope of the line for Structure B also indicates greater financial leverage.

e. If EBIT is greater than $75,000, Structure B is recommended since changes in EPS are much greater for given values of EBIT.

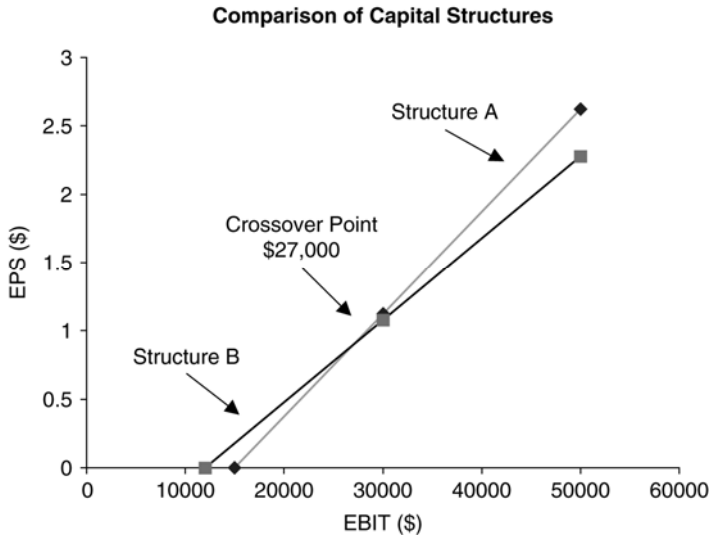
P11-19. LG 5: EBIT-EPS and preferred stock

Intermediate

a.

	Structure A		**Structure B**	
EBIT	$30,000	$50,000	$30,000	$50,000
Less: Interest	12,000	12,000	7,500	7,500
Net profits before taxes	$18,000	$38,000	$22,500	$42,500
Less: Taxes	7,200	15,200	9,000	17,000
Net profit after taxes	$10,800	$22,800	$13,500	$25,500
Less: Preferred dividends	1,800	1,800	2,700	2,700
Earnings available for common shareholders	$ 9,000	$21,000	$10,800	$22,800
EPS (8,000 shares)	$ 1.125	$ 2.625		
EPS (10,000 shares)			$ 1.08	$ 2.28

b.



c. Structure A has greater financial leverage, hence greater financial risk.

d. If EBIT is expected to be below $27,000, Structure B is preferred. If EBIT is expected to be above $27,000, Structure A is preferred.

e. If EBIT is expected to be $35,000, Structure A is recommended since changes in EPS are much greater for given values of EBIT.

P11-20. LG 3, 4, 6: Integrative–Optimal capital structures

Challenge

a. **0% debt ratio**

	Probability		
	0.20	**0.60**	**0.20**
Sales	$200,000	$300,000	$400,000
Less: Variable costs (40%)	80,000	120,000	160,000
Less: Fixed costs	100,000	100,000	100,000
EBIT	$ 20,000	$ 80,000	$140,000
Less: Interest	0	0	0
Earnings before taxes	$ 20,000	$ 80,000	$140,000
Less: Taxes	8,000	32,000	56,000
Earnings after taxes	$ 12,000	$ 48,000	$ 84,000
EPS (25,000 shares)	$ 0.48	$ 1.92	$ 3.36

20% debt ratio:

Total capital = $250,000 (100% equity = 25,000 shares × $10 book value)
Amount of debt = 20% × $250,000 = $50,000
Amount of equity = 80% × 250,000 = $200,000
Number of shares = $200,000 ÷ $10 book value = 20,000 shares

	Probability		
	0.20	**0.60**	**0.20**
EBIT	$20,000	$80,000	$140,000
Less: Interest	5,000	5,000	5,000
Earnings before taxes	$15,000	$75,000	$135,000
Less: Taxes	6,000	30,000	54,000
Earnings after taxes	$ 9,000	$45,000	$ 81,000
EPS (20,000 shares)	$ 0.45	$ 2.25	$ 4.05

40% debt ratio:

Amount of debt = 40% × $250,000 = total debt capital = $100,000
Number of shares = $150,000 equity ÷ $10 book value = 15,000 shares

	Probability		
	0.20	**0.60**	**0.20**
EBIT	$20,000	$80,000	$140,000
Less: Interest	12,000	12,000	12,000
Earnings before taxes	$ 8,000	$68,000	$128,000
Less: Taxes	3,200	27,200	51,200
Earnings after taxes	$ 4,800	$40,800	$ 76,800
EPS (15,000 shares)	$ 0.32	$ 2.72	$ 5.12

60% debt ratio:

Amount of debt = 60% × $250,000 = total debt capital = $150,000

Number of shares = $100,000 equity ÷ $10 book value = 10,000 shares

	Probability		
	0.20	**0.60**	**0.20**
EBIT	$20,000	$80,000	$140,000
Less: Interest	21,000	21,000	21,000
Earnings before taxes	$ (1,000)	$59,000	$119,000
Less: Taxes	(400)	23,600	47,600
Earnings after taxes	$ (600)	$35,400	$ 71,400
EPS (10,000 shares)	$ (0.06)	$ 3.54	$ 7.14

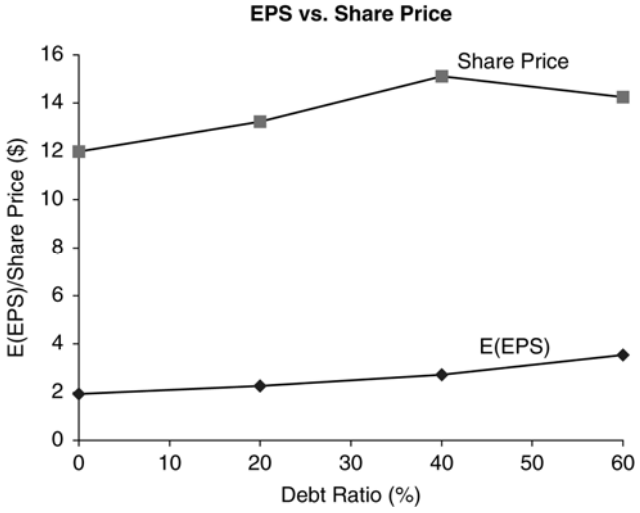
Debt Ratio	E(EPS)	σ(EPS)	CV (EPS)	Number of Common Shares	Dollar Amount of Debt	Share Price*
0%	$1.92	0.9107	0.4743	25,000	0	$1.92/0.16 = $12.00
20%	$2.25	1.1384	0.5060	20,000	$ 50,000	$2.25/0.17 = $13.24
40%	$2.72	1.5179	0.5581	15,000	$100,000	$2.72/0.18 = $15.11
60%	$3.54	2.2768	0.6432	10,000	$150,000	$3.54/0.24 = $14.75

*Share price: E(EPS) ÷ required return for CV for E(EPS), from table in problem.

b. 1. Optimal capital structure to maximize EPS: 60% debt
40% equity

2. Optimal capital structure to maximize share price: 40% debt
60% equity

c.



P11-21. LG 5, 6: Integrative—Optimal Capital Structure

a.

Debt Ratio	Amount of Debt	Amount of Equity	Number of Shares of Common Stock*
0%	$ 0	$1,000,000	40,000
15%	150,000	850,000	34,000
30%	300,000	700,000	28,000
45%	450,000	550,000	22,000
60%	600,000	400,000	16,000

*Dollar amount of equity ÷ $25 per share = Number of shares of common stock.

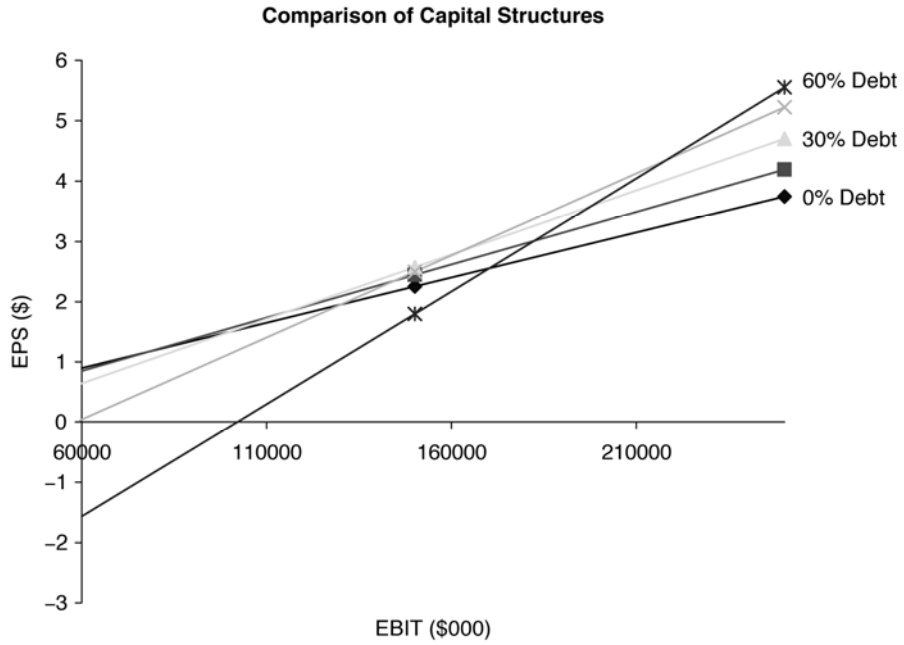
b.

Debt Ratio	Amount of Debt	Cost of Debt	Annual Interest
0%	$ 0	0.0%	$ 0
15%	150,000	8.0	12,000
30%	300,000	10.0	30,000
45%	450,000	13.0	58,500
60%	600,000	17.0	102,000

c. EPS = [(EBIT – Interest) (1 –T)] ÷ Number of common shares outstanding.

Debt Ratio	Calculation	EPS
0%	{[($150,000 – $ 0) × (1 – 0.40)] ÷ 40,000}	= $2.25
	{[($250,000 – $ 0) × (1 – 0.40)] ÷ 40,000}	= $3.75
15%	{[($150,000 – $12,000) × (1 – 0.40)] ÷ 34,000}	= $2.44
	{[($250,000 – $12,000) × (1 – 0.40)] ÷ 34,000}	= $4.20
30%	{[($150,000 – $30,000) × (1 – 0.40)] ÷ 28,000}	= $2.57
	{[($250,000 – $30,000) × (1 – 0.40)] ÷ 28,000}	= $4.71
45%	{[($150,000 – $58,500) × (1 – 0.40)] ÷ 22,000}	= $2.50
	{[($250,000 – $58,500) × (1 – 0.40)] ÷ 22,000}	= $5.22
60%	{[($150,000 – $102,000) × (1 – 0.40)] ÷ 16,000}	= $1.80
	{[($250,000 – $102,000) × (1 – 0.40)] ÷ 16,000}	= $5.55

d.



The EBIT ranges over which each capital structure is preferred are as follows:

Debt Ratio	EBIT Range
0%	$0–$80,000
15%	$80,001–$114,000
30%	$114,001–$163,000
45%	$163,001–$218,000
60%	above $218,000

To calculate the intersection points on the graphic representation of the EBIT-EPS approach to capital structure, the EBIT level which equates EPS for each capital structure must be found, using the following formula.

$$\text{EPS} = \frac{(1-T)\times(\text{EBIT}-I)-\text{PD}}{\text{number of common shares outstanding}}$$

Set EPS 0% = EPS 15%
EPS 15% = EPS 30%
EPS 30% = EPS 45%
EPS 45% = EPS 60%

The first calculation, EPS 0% = EPS 15%, is illustrated:

$$EPS_{0\%} = \frac{[(1-0.4)(EBIT - \$0) - 0]}{40{,}000 \text{ shares}}$$

$$EPS_{15\%} = \frac{[(1-0.4)(EBIT - \$12{,}000) - 0]}{34{,}000 \text{ shares}}$$

$$20{,}400\ EBIT = 24{,}000\ EBIT - 288{,}000{,}000$$

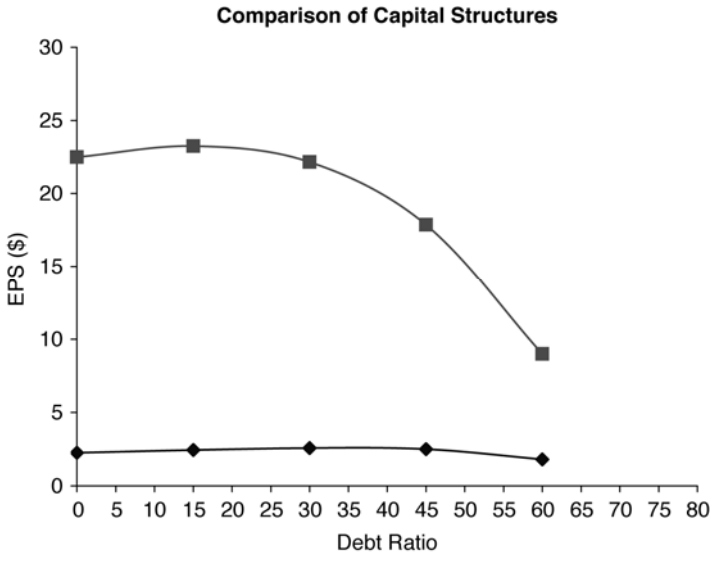
$$EBIT = \frac{288{,}000{,}000}{3{,}600} = \$80{,}000$$

The major problem with this approach is that is does not consider maximization of shareholder wealth (i.e., share price).

e.

	EBIT = $150,000		**EBIT = $250,000**	
Debt Ratio	**EPS ÷ k_s**	**Share Price**	**EPS ÷ k_s**	**Share Price**
0%	$2.25 ÷ 0.100	$22.50	$3.75 ÷ 0.100	$37.50
15%	$2.44 ÷ 0.105	$23.24	$4.20 ÷ 0.105	$40.00
30%	$2.57 ÷ 0.116	$22.16	$4.71 ÷ 0.116	$40.60
45%	$2.50 ÷ 0.140	$17.86	$5.22 ÷ 0.140	$37.29
60%	$1.80 ÷ 0.200	$9.00	$5.55 ÷ 0.200	$27.75

f.



g. At an EBIT of $150,000, to maximize EPS the 30% debt structure is preferred. To maximize share value, the 15% debt structure is preferred. A capital structure with 15% debt is recommended because it maximizes share value and satisfies the goal of maximization of shareholder wealth.

At an EBIT of $250,000, to maximize EPS, the 60% debt structure is preferred. However, in order to maximize share value, the 30% debt structure is recommended.

P11-22. Ethics problem

Information asymmetry applies to situations in which one party has more and better information than the other interested party(ies). This appears to be exactly the situation in which managers overleverage or lead a buyout of the company. Existing bondholders and possibly stockholders are harmed by the financial risk of overleveraging, and existing stockholders are harmed if they accept a buyout price less than that warranted by accurate and incomplete information.

The board of directors has a fiduciary duty toward stockholders, and hopefully bears an ethical concern toward bondholders as well. The board can and should insist that management divulge all information it possess on the future plans and risks the company faces (although, caution to keep this out of the hands of competitors is warranted). The board should be cautious to select and retain Chief executive officers (CEOs) with high integrity, and continue to emphasize an ethical "tone at the top." (Students will no doubt think of other creative mechanisms to deal with this situation.)

■ Case

Evaluating Tampa Manufacturing Capital Structure

This case asks the student to evaluate Tampa Manufacturing's current and proposed capital structures in terms of maximization of EPS and financial risk before recommending one. It challenges the student to go beyond just the numbers and consider the overall impact of his or her choices on the firm's financial policies.

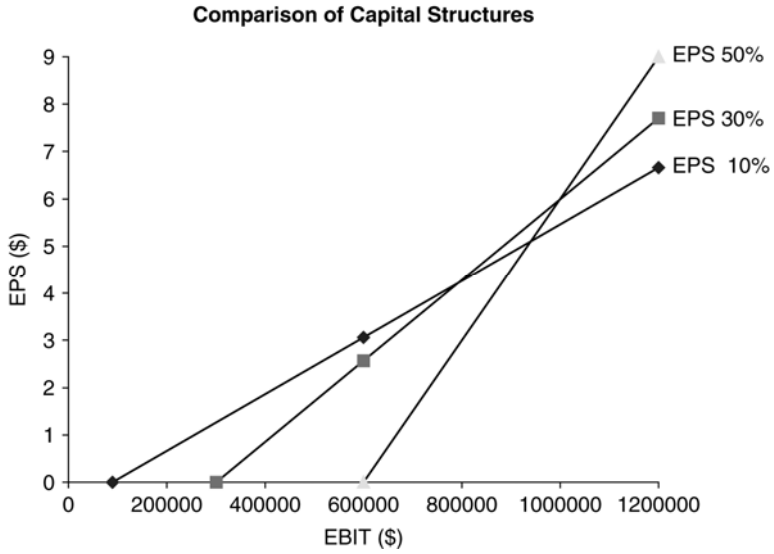
1. Times interest earned calculations

	Current 10% Debt	**Alternative A 30% Debt**	**Alternative B 50% Debt**
Debt	$1,000,000	$3,000,000	$5,000,000
Coupon rate	0.09	0.10	0.12
Interest	$ 90,000	$ 300,000	$ 600,000
EBIT	$1,200,000	$1,200,000	$1,200,000
Interest	$ 90,000	$ 300,000	$ 600,000
Times interest earned =	13.33	4	2

As the debt ratio increases from 10% to 50%, so do both financial leverage and risk. At 10% debt and $1,200,000 EBIT, the firm has over 13 times coverage of interest payments; at 30%, it still has 4 times coverage. At 50% debt, the highest financial leverage, coverage drops to 2 times, which may not provide enough cushion. Both the times interest earned and debt ratios should be compared to those of the printing equipment industry.

2. EBIT-EPS calculations (using any two EBIT levels)

	Current 10% Debt 100,000 Shares		Alternative A 30% Debt 70,000 Shares		Alternative B 50% Debt 40,000 Shares	
EBIT	$600,000	$1,200,000	$600,000	$1,200,000	$600,000	$1,200,000
Interest	90,000	90,000	300,000	300,000	600,000	600,000
PBT	$510,000	$1,110,000	$300,000	$ 900,000	$ 0	$ 600,000
Taxes	204,000	444,000	120,000	360,000	0	240,000
PAT	$306,000	$ 666,000	$180,000	$ 540,000	$ 0	$ 360,000
EPS	$ 3.06	$ 6.66	$ 2.57	$ 7.71	0	$ 9.00



3. If Tampa Manufacturing's EBIT is $1,200,000, EPS is highest with the 50% debt ratio. The steeper slope of the lines representing higher debt levels demonstrates that financial leverage increases as the debt ratio increases. Although EPS is highest at 50%, the company must also take into consideration the financial risk of each alternative. The drawback to the EBIT-EPS approach is its emphasis on maximizing EPS rather than owner's wealth. It does not take risk into account. Also, if EBIT falls below about $750,000 (intersection of 10% and 30% debt), EPS is higher with a capital structure of 10%.

4. Market value: $P_0 = \text{EPS} \div r_s$

   Current: $6.66 ÷ 0.12 = $55.50

   Alternative A—30%: $7.71 ÷ 0.13 = $59.31

   Alternative B—50%: $9.00 ÷ 0.18 = $50.00

5. Alternative A, 30% debt, appears to be the best alternative. Although EPS is higher with Alternative B, the financial risk is high; times interest earned is only 2 times. Alternative A has a moderate risk level, with 4 times coverage of interest earned, and provides increased market value. Choosing this capital structure allows the firm to benefit from financial leverage while not taking on too much financial risk.

■ Spreadsheet Exercise

The answer to Chapter 11's determination of the optimal capital structure at Starstruck Company spreadsheet problem is located in the Instructor's Resource Center at *www.prenhall.com/irc*.

■ A Note on Web Exercises

A series of chapter-relevant assignments requiring Internet access can be found at the book's Companion Website at *http://www.prenhall.com/gitman*. In the course of completing the assignments students access information about a firm, its industry, and the macro economy, and conduct analyses consistent with those found in each respective chapter.