Earnings before interest and corporate taxes (EBIT)	$1,000,000	$1,000,000
Interest (R_BB)	0	400,000
Earnings before taxes (EBT) = (EBIT − R_BB)	$1,000,000	$ 600,000
Taxes (t_c = .35)	350,000	210,000
Earnings after corporate taxes	$ 650,000	$ 390,000
(EAT) = [(EBIT − R_BB) × (1 − t_c)]		
Total cash flow to both stockholders and bondholders	$ 650,000	$ 790,000
[EBIT × (1 − t_c) + t_cR_BB]		

The most relevant numbers for our purposes are the two on the bottom line. Dividends, which are equal to earnings after taxes in this example, are the cash flow to stockholders, and interest is the cash flow to bondholders. Here, we see that more cash flow reaches the owners of the firm

arbitrageurs would tend to boost the price of whole milk until proceeds from the two strategies became equal. Thus, the value of the farmer's milk is invariant to the way in which the milk is packaged.

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SUMMARY OF MODIGLIANI-MILLER PROPOSITIONS WITHOUT TAXES

Assumptions

- No taxes.
- No transaction costs.
- Individuals and corporations borrow at same rate.

Results

Proposition I: $V_L = V_u$ (Value of levered firm equals value of unlevered firm)

Proposition II: $R_s = R_0 + \frac{B}{S}(R_0 - R_B)$

Intuition

Proposition I:	Through homemade leverage, individuals can either duplicate or undo the effects of corporate leverage.
Proposition II:	The cost of equity rises with leverage, because the risk to equity rises with leverage.

Food found its way into this chapter earlier, when we viewed the firm as a pie. MM argue that the size of the pie does not change, no matter how stockholders and bondholders divide it. MM say that a firm's capital structure is irrelevant; it is what it is by some historical accident. The theory implies that firms' debt–equity ratios could be anything. They are what they are because of whimsical and random managerial decisions about how much to borrow and how much stock to issue.

Although scholars are always fascinated with far-reaching theories, students are perhaps more concerned with real-world applications. Do real-world managers follow MM by treating capital structure decisions with indifference? Unfortunately for the theory, virtually all companies in certain industries, such as banking, choose high debt-to-equity ratios. Conversely, companies in other industries, such as pharmaceuticals, choose low debt-to-equity ratios. In fact, almost any industry has a debt-to-equity ratio to which companies in that industry tend to adhere. Thus, companies do not appear to be selecting their degree of leverage in a frivolous or random manner. Because of this, financial economists (including MM themselves) have argued that real-world factors may have been left out of the theory.

Though many of our students have argued that individuals can only borrow at rates above the corporate borrowing rate, we disagreed with this argument earlier in the chapter. But when we look elsewhere for unrealistic assumptions in the theory, we find two:[8]

1. Taxes were ignored.
2. Bankruptcy costs and other agency costs were not considered.

We turn to taxes in the next section. Bankruptcy costs and other agency costs will be treated in the next chapter. A summary of the main Modigliani-Miller results without taxes is presented in the nearby boxed section.

14.5 TAXES

The Basic Insight

The previous part of this chapter showed that firm value is unrelated to debt in a world without taxes. We now show that, in the presence of corporate taxes, the firm's value is positively related to its debt. The basic intuition can be seen from a pie chart, such as

the one in Figure 14.4. Consider the all-equity firm on the left. Here, both equityholders and the IRS have claims on the firm. The value of the all-equity firm is, of course, that part of the pie owned by the equityholders. The proportion going to taxes is simply a cost.

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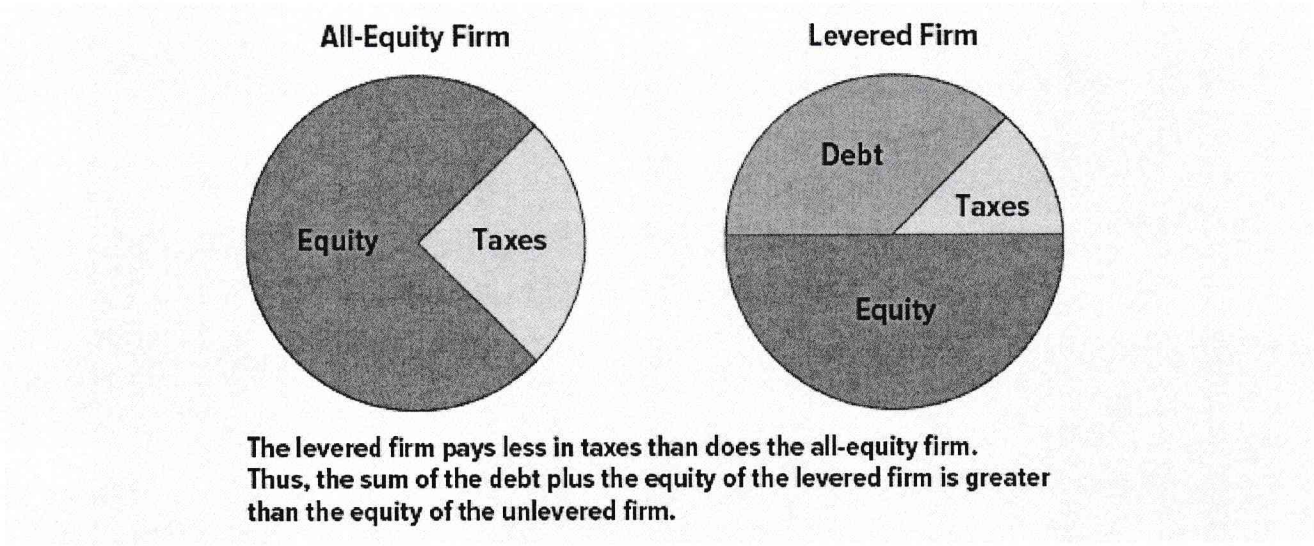
FIGURE 14.4
Two Pie Models of Capital Structure under Corporate Taxes



The pie on the right for the levered firm shows three claims: equityholders, debtholders, and taxes. The value of the levered firm is the sum of the value of the debt and the value of the equity. In selecting between the two capital structures in the picture, a financial manager should select the one with the higher value. Assuming that the total area is the same for both pies,[9] value is maximized for the capital structure paying the least in taxes. In other words, the manager should choose the capital structure that the IRS hates the most.

We will show that due to a quirk in U.S. tax law, the proportion of the pie allocated to taxes is less for the levered firm than it is for the unlevered firm. Thus, managers should select high leverage.

EXAMPLE 14.3

Taxes and Cash Flow

The Water Products Company has a corporate tax rate, t_c, of 35 percent and expected earnings before interest and taxes (EBIT) of $1 million each year. Its entire earnings after taxes are paid out as dividends.

The firm is considering two alternative capital structures. Under Plan *I*, Water Products would have no debt in its capital structure. Under Plan *II*, the company would have $4,000,000 of debt, *B*. The cost of debt, R_B, is 10 percent.

The chief financial officer for Water Products makes the following calculations:

	PLAN *I*	PLAN *II*

Earnings before interest and corporate taxes (EBIT)	$1,000,000	$1,000,000
Interest (R_BB)	0	400,000
Earnings before taxes (EBT) = (EBIT − R_BB)	$1,000,000	$ 600,000
Taxes (t_c = .35)	350,000	210,000
Earnings after corporate taxes	$ 650,000	$ 390,000
(EAT) = [(EBIT − R_BB) × (1 − t_c)]		
Total cash flow to both stockholders and bondholders	$ 650,000	$ 790,000
[EBIT × (1 − t_c) + t_cR_BB]		

The most relevant numbers for our purposes are the two on the bottom line. Dividends, which are equal to earnings after taxes in this example, are the cash flow to stockholders, and interest is the cash flow to bondholders. Here, we see that more cash flow reaches the owners of the firm

(both stockholders and bondholders) under Plan *II*. The difference is \$140,000 (= \$790,000 – 650,000). It does not take one long to realize the source of this difference. The IRS receives less taxes under Plan *II* (\$210,000) than it does under Plan *I* (\$350,000). The difference here is \$140,000 (= \$350,000 – 210,000). page 439

This difference occurs because the way the IRS treats interest is different from the way it treats earnings going to stockholders.[10] Interest totally escapes corporate taxation, whereas earnings after interest but before corporate taxes (EBT) are taxed at the 35 percent rate.

Present Value of the Tax Shield

The discussion above shows a tax advantage to debt or, equivalently, a tax disadvantage to equity. We now want to value this advantage. The dollar interest is:

$$\text{Interest} = \underbrace{R_B}_{\text{Interest rate}} \times \underbrace{B}_{\text{Amount borrowed}}$$

This interest is \$400,000 (= 10 percent × \$4,000,000) for Water Products. All this interest is tax deductible. That is, whatever the taxable income of Water Products would have been without the debt, the taxable income is now \$400,000 *less* with the debt.

Because the corporate tax rate is .35 in our example, the reduction in corporate taxes is \$140,000 (= .35 × \$400,000). This number is identical to the reduction in corporate taxes calculated previously.

Algebraically, the reduction in corporate taxes is:

$$\underbrace{t_c}_{\text{Corporate tax rate}} \times \underbrace{R_B B}_{\text{Dollar amount of interest}} \qquad [14.4]$$

That is, whatever taxes a firm would pay each year without debt, the firm will pay $t_c R_B B$ less with debt of B. Equation 14.4 is often called the *tax shield from debt.* Note that it is an *annual* amount.

As long as the firm expects to be in a positive tax bracket, we can assume that the cash flow in Equation 14.4 has the same risk as the interest on the debt. Thus, its value can be determined by discounting at the cost of debt, R_B. Assuming that the cash flows are perpetual, the present value of the tax shield is:

$$\frac{t_c R_B B}{R_B} = t_c B$$

Value of the Levered Firm

We have just calculated the present value of the tax shield from debt. Our next step is to calculate the value of the levered firm. The annual aftertax cash flow of an unlevered firm is:

$$\text{EBIT} \times (1 - t_c)$$

where EBIT is earnings before interest and taxes. The value of an unlevered firm (that is, a firm with no debt) is the present value of EBIT × $(1 - t_c)$:

$$V_U = \frac{\text{EBIT} \times (1 - t_c)}{R_O}$$

where:

V_U = Present value of an unlevered firm

EBIT × $(1 - t_c)$ = Firm cash flows after corporate taxes

t_c = Corporate tax rate

R_0 = The cost of capital to an all-equity firm. As can be seen from the formula, R_0 now discounts *aftertax* cash flows.

As shown previously, leverage increases the value of the firm by the tax shield, which is t_cB for perpetual debt. Thus, we merely add this tax shield to the value of the unlevered firm to get the value of the levered firm.

We can write this algebraically as:

MM Proposition I (corporate taxes):

$$V_L = \frac{\text{EBIT} \times 1 - t_c}{R_0} + \frac{t_c R_B B}{R_B} = V_U + t_c B \qquad [14.5]$$

Equation 14.5 is MM Proposition I under corporate taxes. The first term in Equation 14.5 is the value of the cash flows of the firm with no debt tax shield. In other words, this term is equal to V_U, the value of the all-equity firm. The value of the levered firm is the value of an all-equity firm plus t_cB, the tax rate times the value of the debt. t_cB is the present value of the tax shield in the case of perpetual cash flows. Because the tax shield increases with the amount of debt, the firm can raise its total cash flow and its value by substituting debt for equity.

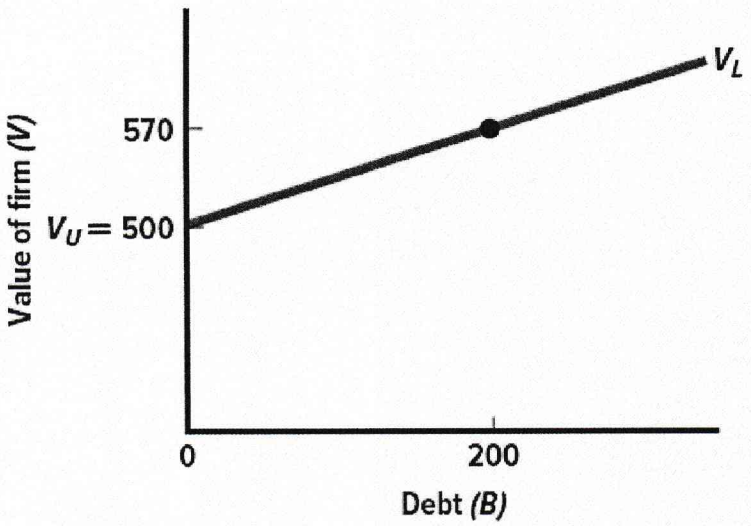
EXAMPLE 14.4

MM with Corporate Taxes

Divided Airlines is currently an unlevered firm. The company expects to generate $153.85 in earnings before interest and taxes (EBIT) in perpetuity. The corporate tax rate is 35 percent, implying aftertax earnings of $100. All earnings after tax are paid out as dividends.

The firm is considering a capital restructuring to allow $200 of debt. Its cost of debt capital is 10 percent. Unlevered firms in the same industry have a cost of equity capital of 20 percent. What will the new value of Divided Airlines be?

FIGURE 14.5
The Effect of Financial Leverage on Firm Value: MM with Corporate Taxes in the Case of Divided Airlines



$$V = V_U + t_C B$$
$$= \$500 + (.35 \times \$200)$$
$$= \$570$$

Debt reduces Divided's tax burden. As a result, the value of the firm is positively related to debt.

The value of Divided Airlines will be equal to:

$$V_L = \frac{\text{EBIT} \times (1 - t_c)}{R_0} + t_c B$$
$$= \$100/.20 + (.35 \times \$200)$$
$$= \$500 + 70$$
$$= \$570$$

The value of the levered firm is $570, which is greater than the unlevered value of $500. Because $V_L = B + S$, the value of levered equity, S, is equal to $570 – 200 = $370. The value of Divided Airlines as a function of leverage is illustrated in Figure 14.5.

Expected Return and Leverage under Corporate Taxes

MM Proposition II under no taxes posits a positive relationship between the expected return on equity and leverage. This result occurs because the risk of equity increases with leverage. The same intuition also holds in a world of corporate taxes. The exact formula in a world of corporate taxes is:

MM Proposition II (corporate taxes):

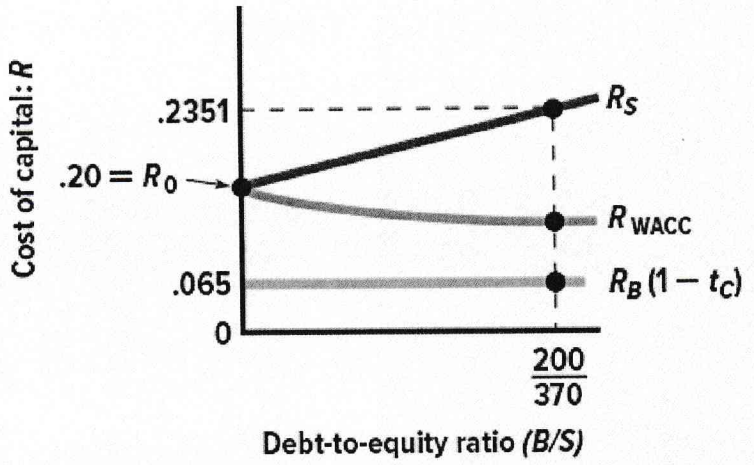
$$R_S = R_0 + \frac{B}{S} \times (1 - t_c) \times (R_0 - R_B) \qquad [14.6]$$

Applying the formula to Divided Airlines, we get:

$$R_S = .2351 = .20 + \frac{200}{370} \times (1 - .35) \times (.20 - .10)$$

This calculation is illustrated in Figure 14.6.

FIGURE 14.6
The Effect of Financial Leverage on the Cost of Debt and Equity Capital



$$R_S = R_0 + (1 - t_C)(R_0 - R_B)B/S = 20 + \left(.65 \times .10 \times \frac{200}{370}\right) = .2351$$

Financial leverage adds risk to the firm's equity. As compensation, the cost of equity rises with the firm's risk. Note that R_0 is a single point, while R_S, $R_B(1 - t_C)$, and R_{WACC} are all entire lines.

Whenever $R_0 > R_B$, R_S increases with leverage, a result that we also found in the no-tax case. As stated earlier in this chapter, R_0 should exceed R_B. That is, since equity (even unlevered equity) is risky, it should have an expected return greater than that on the less risky debt.

Let's check our calculations by determining the value of the levered equity in another way. The algebraic formula for the value of levered equity is:

$$S = \frac{(\text{EBIT} - R_B B) \times (1 - t_C)}{R_S}$$

The numerator is the expected cash flow to levered equity after interest and taxes. The denominator is the rate at which the cash flow to equity is discounted.

For Divided Airlines we get:

$$\frac{(\$153.85 - .10 \times \$200)(1 - .35)}{.2351} = \$370$$

This is the same result we obtained earlier (ignoring a small rounding error).

The Weighted Average Cost of Capital (R_{WACC}) and Corporate Taxes

In Chapter 12, we defined the weighted average cost of capital (with corporate taxes) as follows (note that $V_L = S + B$):

$$R_{WACC} = \frac{S}{V_L} R_S + \frac{B}{V_L} R_B (1 - t_C)$$

Note that the cost of debt capital, R_B, is multiplied by $(1 - t_C)$ because interest is tax deductible at the corporate level. However, the cost of equity, R_S, is not multiplied by this factor because dividends are not deductible. In the no-tax case, R_{WACC} is not affected by leverage. This result is reflected in Figure 14.3, which we discussed earlier. However, since debt is tax advantaged relative to equity, it can be shown that R_{WACC} declines with leverage in a world with corporate taxes. This result can be seen in Figure 14.6.

For Divided Airlines, R_{WACC} is equal to:

$$R_{WACC} = \left(\frac{370}{570} \times .2351\right) + \left(\frac{200}{570} \times .10 \times .65\right) = .1754, \text{ or } 17.54\%$$

Divided Airlines has reduced its R_{WACC} from .20 (with no debt) to .1754 with reliance on debt. This result is intuitively pleasing because it suggests that when a firm lowers its R_{WACC}, the firm's value will increase. Using the R_{WACC} approach, we can confirm that the value of Divided Airlines is $570:

$$V_L = \frac{\text{EBIT} \times (1 - t_C)}{R_{WACC}} = \frac{\$100}{.1754} = \$570$$

Stock Price and Leverage under Corporate Taxes

At this point, students often believe the numbers—or at least are too intimidated to dispute them. However, they sometimes think we have asked the wrong question. "Why are we choosing to maximize the value of the firm?" they will say. "If managers are looking out for the stockholders' interest, why aren't they trying to maximize stock price?" If this question occurred to you, you have come to the right section.

Our response is twofold: First, we showed in the first section of this chapter that the capital structure that maximizes firm value is also the one that most benefits the interests of the stockholders.

However, that general explanation is not always convincing to students. As a second procedure, we calculate the stock price of Divided Airlines both before and after the exchange

of debt for stock. We do this by presenting a set of market value balance sheets. The market value balance sheet for the company in its all-equity form can be represented as: page 443

DIVIDED AIRLINES
Balance Sheet
(all-equity firm)

Physical assets:		Equity	$500
$\frac{\$153.85}{.20} \times (1 - .35) = \$500$			(100 shares)

Assuming that there are 100 shares outstanding, each share is worth \$5 = \$500/100.

Next, imagine the company announces that, in the near future, it will issue \$200 of debt to buy back \$200 of stock. We know from our previous discussion that the value of the firm will rise to reflect the tax shield of debt. If we assume that capital markets efficiently price securities, the increase occurs immediately. That is, the rise occurs on the day of the announcement, not on the date of the debt-for-equity exchange. The market value balance sheet now becomes:

DIVIDED AIRLINES
Balance Sheet
(upon announcement of debt issue)

Physical assets:	$500	Equity	$570 (100 shares)
Present value of tax shield:			
$t_c B$ = 35% × \$200 =	70		
Total assets	$570		

Note that the debt has not yet been issued. Therefore, only equity appears on the right-hand side of the balance sheet. Each share is now worth \$570/100 = \$5.70, implying that the stockholders have benefited by \$70. The equityholders gain because they are the owners of a firm that has improved its financial policy.

The introduction of the tax shield to the balance sheet is perplexing to many students. Although physical assets are tangible, the ethereal nature of the tax shield bothers these students. However, remember that an asset is any item with value. The tax shield has value because it reduces the stream of future taxes. The fact that one cannot touch the shield in the way that one can touch a physical asset is a philosophical, not financial, consideration.

At some point, the exchange of debt for equity occurs. Debt of \$200 is issued, and the proceeds are used to buy back shares. How many shares of stock are repurchased? Because shares are now selling at \$5.70 each, the number of shares that the firm acquires is \$200/\$5.70 = 35.09. This leaves 64.91 (= 100 – 35.09) shares of stock outstanding. The market value balance sheet is now:

DIVIDED AIRLINES
Balance Sheet
(after exchange has taken place)

Physical assets:	$500	Equity	$370
			(100 – 35.09 = 64.91 shares)
Present value of tax shield	70	Debt	200
Total assets	$570	Debt plus equity	$570

Each share of stock is worth $370/64.91 = $5.70 after the exchange. Notice that the stock price does not change on the exchange date. As we mentioned above, the stock price moves on the date of the announcement only. Because the shareholders participating in the exchange receive a price equal to the market price per share after the exchange, they do not care whether they exchange their stock or not.

This example was provided for two reasons. First, it shows that an increase in the value of the firm from debt financing leads to an increase in the price of the stock. In fact, the stockholders capture the entire $70 tax shield. Second, we wanted to provide more work with market value balance sheets.

A summary of the main results of Modigliani-Miller with corporate taxes is presented in the following boxed section:

SUMMARY OF MODIGLIANI-MILLER PROPOSITIONS WITH CORPORATE TAXES

Assumptions

- Corporations are taxed at the rate t_c on earnings after interest.
- No transaction costs.
- Individuals and corporations borrow at same rate.

Results

Proposition I:	$V_L = V_u + t_cB$ (for a firm with perpetual debt)
Proposition II:	$R_s = R_0$ B/S $(1 - t_c)(R_0 - R_B)$

Intuition

Proposition I:	Since corporations can deduct interest payments but not dividend payments, corporate leverage lowers tax payments.
Proposition II:	The cost of equity rises with leverage because the risk to equity rises with leverage.

SUMMARY AND CONCLUSIONS

1. We began our discussion of the capital structure decision by arguing that the particular capital structure that maximizes the value of the firm is also the one that provides the most benefit to the stockholders.
2. In a world of no taxes, the famous Proposition I of Modigliani and Miller proves that the value of the firm is unaffected by the debt-to-equity ratio. In other words, a firm's capital structure is a matter of indifference in that world. The authors obtain their results by showing that either a high or a low corporate ratio of debt to equity can be offset by homemade leverage. The result hinges on the assumption that individuals can borrow at the same rate as corporations, an assumption we believe to be quite plausible.
3. MM's Proposition II in a world without taxes states that:

$$R_S = R_0 + \frac{B}{S}(R_0 - R_B)$$

This implies that the expected rate of return on equity (also called the *cost of equity* or the *required return on equity*) is positively related to the firm's leverage. This makes intuitive sense because the risk of equity rises with leverage, a point illustrated by Figure 14.2.

4. While the above work of MM is quite elegant, it does not explain the empirical findings on capital structure very well. MM imply that the capital structure decision is a matter of indifference, while the decision appears to be a weighty one in the real world. To achieve real-world applicability, we next considered corporate taxes.

5. In a world with corporate taxes but no bankruptcy costs, firm value is an increasing function of leverage. The formula for the value of the firm is:

$$V_L = V_U + t_c B$$

Expected return on levered equity can be expressed as:

$$R_S = R_0 + (1 - t_C) \times (R_0 - R_B) \times \frac{B}{S}$$

Here, value is positively related to leverage. This result implies that firms should have a capital structure almost entirely composed of debt. Because real-world firms select more moderate levels of debt, the next chapter considers modifications to the results of this chapter.

CONCEPT QUESTIONS

1. **MM Assumptions** List the three assumptions that lie behind the Modigliani-Miller theory in a world without taxes. Are these assumptions reasonable in the real world? Explain.
2. **MM Propositions** In a world with no taxes, no transaction costs, and no costs of financial distress, is the following statement true, false, or uncertain? If a firm issues equity to repurchase some of its debt, the price per share of the firm's stock will rise because the shares are less risky. Explain.
3. **MM Propositions** In a world with no taxes, no transaction costs, and no costs of financial distress, is the following statement true, false, or uncertain? Moderate borrowing will not increase the required return on a firm's equity. Explain.
4. **MM Propositions** What is the quirk in the tax code that makes a levered firm more valuable than an otherwise identical unlevered firm?
5. **Business Risk versus Financial Risk** Explain what is meant by business and financial risk. Suppose Firm A has greater business risk than Firm B. Is it true that Firm A also has a higher cost of equity capital? Explain.
6. **MM Propositions** How would you answer in the following debate?

   Q: Isn't it true that the riskiness of a firm's equity will rise if the firm increases its use of debt financing?

   A: Yes, that's the essence of MM Proposition II.

   Q: And isn't it true that, as a firm increases its use of borrowing, the likelihood of default increases, thereby increasing the risk of the firm's debt?

   A: Yes.

   Q: In other words, increased borrowing increases the risk of the equity *and* the debt?

   A: That's right.

   Q: Well, given that the firm uses only debt and equity financing, and given that the risks of both are increased by increased borrowing, does it not follow that increasing debt increases the overall risk of the firm and therefore decreases the value of the firm?

   A: ??

7. **Optimal Capital Structure** Is there an easily identifiable debt–equity ratio that will maximize the value of a firm? Why or why not?
8. **Financial Leverage** Why is the use of debt financing referred to as financial "leverage"
9. **Homemade Leverage** What is homemade leverage?
10. **Capital Structure Goal** What is the basic goal of financial management with regard to capital structure?

QUESTIONS AND PROBLEMS

connect

Basic (Questions 1–16)

1. **EBIT and Leverage** Castle, Inc., has no debt outstanding and a total market value of $305,000. Earnings before interest and taxes, EBIT, are projected to be $26,000 if economic conditions are normal. If there is strong expansion in the economy, then EBIT will be 20 percent higher. If there is a recession, then EBIT will be 25 percent lower. The firm is considering a debt issue of $95,000 with an interest rate of 6 percent. The proceeds will be used to repurchase shares of stock. There are currently 5,000 shares outstanding. Ignore taxes for this problem.

   a. Calculate earnings per share, EPS, under each of the three economic scenarios before any debt is issued. Also, calculate the percentage changes in EPS when the economy expands or enters a recession.

   b. Repeat part (a) assuming that the firm goes through with recapitalization. What do you observe?

2. **EBIT, Taxes, and Leverage** Repeat parts (a) and (b) in Problem 1 assuming the firm has a tax rate of 35 percent.

ROE and Leverage Suppose the firm in Problem 1 has a market-to-book ratio of 1.0. page 446

a. Calculate return on equity, ROE, under each of the three economic scenarios before any debt is issued. Also, calculate the percentage changes in ROE for economic expansion and recession, assuming no taxes.

b. Repeat part (a) assuming the firm goes through with the proposed recapitalization.

c. Repeat parts (a) and (b) of this problem assuming the firm has a tax rate of 35 percent.

4. **Break-Even EBIT** Hale Corporation is comparing two different capital structures, an all-equity plan (Plan I) and a levered plan (Plan II). Under Plan I, the company would have 145,000 shares of stock outstanding. Under Plan II, there would be 90,000 shares of stock outstanding and $3,047,000 in debt outstanding. The interest rate on the debt is 8 percent and there are no taxes.

a. If EBIT is $400,000, which plan will result in the higher EPS?

b. If EBIT is $700,000, which plan will result in the higher EPS?

c. What is the break-even EBIT?

5. **MM and Stock Value** In Problem 4, use MM Proposition I to find the price per share of equity under each of the two proposed plans. What is the value of the firm?

6. **Break-Even EBIT and Leverage** Coldstream Corp. is comparing two different capital structures. Plan I would result in 3,700 shares of stock and $13,700 in debt. Plan II would result in 3,100 shares of stock and $30,140 in debt. The interest rate on the debt is 7 percent.

a. Ignoring taxes, compare both of these plans to an all-equity plan assuming that EBIT will be $7,600. The all-equity plan would result in 4,200 shares of stock outstanding. Which of the three plans has the highest EPS? The lowest?

b. In part (a), what are the break-even levels of EBIT for each plan as compared to that for an all-equity plan? Is one higher than the other? Why?

c. Ignoring taxes, when will EPS be identical for Plans I and II?

d. Repeat parts (a), (b), and (c) assuming that the corporate tax rate is 40 percent. Are the break-even levels of EBIT different from before? Why or why not?

7. **Leverage and Stock Value** Ignoring taxes in Problem 6, what is the price per share of equity under Plan I? Plan II? What principle is illustrated by your answers?

8. **Homemade Leverage** Conspicuous Consumption, Inc., a prominent consumer products firm, is debating whether or not to convert its all-equity capital structure to one that is 35 percent debt. Currently, there are 7,600 shares outstanding and the price per share is $55. EBIT is expected to remain at $36,000 per year forever. The interest rate on new debt is 8 percent, and there are no taxes.

a. Ms. Brown, a shareholder of the firm, owns 100 shares of stock. What is her cash flow under the current capital structure, assuming the firm has a dividend payout rate of 100 percent?

b. What will Ms. Brown's cash flow be under the proposed capital structure of the firm? Assume that she keeps all 100 of her shares.

c. Suppose the company does convert, but Ms. Brown prefers the current all-equity capital structure. Show how she could unlever her shares of stock to re-create the original capital structure.

d. Using your answer to part (c), explain why the company's choice of capital structure is irrelevant.

9. Homemade Leverage and WACC ABC Co. and XYZ Co. are identical firms in all respects except for their capital structures. ABC is all equity financed with $650,000 in stock. XYZ uses both stock and perpetual debt; its stock is worth $325,000 and the interest rate on its debt is 8 percent. Both firms expect EBIT to be $70,000. Ignore taxes.

a. Richard owns $20,000 worth of XYZ's stock. What rate of return is he expecting?

b. Show how Richard could generate exactly the same cash flows and rate of return by investing in ABC and using homemade leverage.

c. What is the cost of equity for ABC? What is it for XYZ?

d. What is the WACC for ABC? For XYZ? What principle have you illustrated?