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profits total \$500,000, and the firm's assets (all equity financed) are \$5 million. The firm estimates that it can change its production process, adding \$4 million to investment and \$500,000 to fixed operating costs. This change will (1) reduce variable costs per unit by \$10,000 and (2) increase output by 20 units, but (3) the sales price on all units will have to be lowered to \$95,000 to permit sales of the additional output. The firm has tax loss carryforwards that render its tax rate zero, its cost of equity is 16%, and it uses no debt.

- What is the incremental profit? To get a rough idea of the project's profitability, what is the project's expected rate of return for the next year (defined as the incremental profit divided by the investment)? Should the firm make the investment? Why or why not?
- Would the firm's break-even point increase or decrease if it made the change?
- Would the new situation expose the firm to more or less business risk than the old one?

(15-8)
Capital Structure
Analysis

The Rivoli Company has no debt outstanding, and its financial position is given by the following data:

Assets (Market value = Book value)	\$3,000,000
EBIT	\$ 500,000
Cost of equity, r_s	10%
Stock price, P_0	\$ 15
Shares outstanding, n_0	200,000
Tax rate, T (federal-plus-state)	40%

The firm is considering selling bonds and simultaneously repurchasing some of its stock. If it moves to a capital structure with 30% debt based on market values, its cost of equity, r_s , will increase to 11% to reflect the increased risk. Bonds can be sold at a cost, r_d , of 7%. Rivoli is a no-growth firm. Hence, all its earnings are paid out as dividends. Earnings are expected to be constant over time.

- What effect would this use of leverage have on the value of the firm?
- What would be the price of Rivoli's stock?
- What happens to the firm's earnings per share after the recapitalization?
- The \$500,000 EBIT given previously is actually the expected value from the following probability distribution:

Probability	EBIT
0.10	(\$ 100,000)
0.20	200,000
0.40	500,000
0.20	800,000
0.10	1,100,000

Determine the times-interest-earned ratio for each probability. What is the probability of not covering the interest payment at the 30% debt level?

Challenging
Problems 9-11

(15-9)
Capital Structure
Analysis

Pettit Printing Company has a total market value of \$100 million, consisting of 1 million shares selling for \$50 per share and \$50 million of 10% perpetual bonds now selling at par. The company's EBIT is \$13.24 million, and its tax rate is 15%. Pettit can change its capital structure by either increasing its debt to 70% (based on market values) or decreasing it



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