Assume you own all of the stock in an unlevered firm with a market value of $100,000. The firm is considering whether or not it should issue $40,000 of risk-free debt paying an interest rate of 3% and use the proceeds to repurchase $40,000 of your shares. Note: Some calculations are necessary to answer each of the following.

a. Assume that markets are perfect. What is the value of your stock after the debt issue/share repurchase? How much has your wealth changed because of the debt issue/share repurchase? What key issue drives this result?

b. Assume that instead of markets being perfect, the corporate tax rate is 30%. What is the value of your stock after the debt issue/share repurchase? How much has your wealth changed as a result of the debt issue/share repurchase? What key issue drives the difference between your answers in a. and b.?

c. Assume (as in part b) that the corporate tax rate is 30%, but also assume that the personal tax rate on interest income is 40% and that the personal tax on equity income is 25%. What is the value of your stock after the debt issue/share repurchase? How has your wealth changed as a result of the debt issue/share repurchase (relative to if the firm does not have a debt issue/share repurchase)? What key issue drives the difference between your answers in a. and b.?

Wall Street Journal Questions are on the back of this page.

a. Not affected

\[ \Rightarrow V^d = V^u = 100,000 \]

\[ V_{stock} = 100,000 - 40,000 = 60,000 \]

\[ Wealth = stock + cash = 60,000 + 40,000 = 100,000 \]

Key: value of firm does not change as leverage changes.

b. Rises by $12,000 = 112,000 - 100,000

\[ \Rightarrow V^d = V^u + \Delta V = 100,000 + 0.3(40,000) = 112,000 \]

\[ V_{stock} = 12,000 - 40,000 = 72,000 \]

\[ Wealth = stock + cash = 72,000 + 40,000 = 112,000 \]

Key: corporate taxes fall as firm issues debt.

c. Rises by $5000 = 105,000 - 100,000

\[ \Rightarrow V^d = V^u + \Delta V \]

\[ \Delta V = 1 - \frac{(1-TC)(1-Tc)}{1-Tc} = 1 - \frac{(1-3)(1-0.25)}{1-0.25} = 0.125 \]

\[ \Rightarrow V^d = 100,000 + 0.125(40,000) = 105,000 \]

\[ V_{stock} = 105,000 - 40,000 = 65,000 \]

\[ Wealth = stock + cash = 65,000 + 40,000 = 105,000 \]

Key: As issue debt + repurchase stock, personal taxes rise since TC < TC.