

Note: There are no points for solving this problem. All points are for setting up the equations, plugging in the relevant numbers, and stating what you want to solve for (if you are not simply solving the equation).

Assume that markets are perfect and that Sequester Inc. has outstanding debt with a market value \$175 million and a book value of \$150 million and outstanding equity with a market value of \$300 million and a book value of \$200 million. Sequester's debt is risk-free and its equity has a beta of 1.25. The cost of capital for Sequester's debt is 2% and for Sequester's equity is 9.5%. Sequester is considering issuing \$50 million of additional stock and using the proceeds to repurchase \$50 million of debt.

- Calculate the beta of Sequester's assets before it issues the additional equity.
- Without doing any calculations, how will the required return on Sequester's equity change after the debt issue/equity repurchase? Why is this the case?
- Calculate the cost of capital on Sequester's equity after the issuance of additional equity.
- Without doing any calculations, how will the debt issue/equity repurchase affect the beta of the firm's assets? Why is this the case?
- Assume you own Sequester stock with a market value of \$300,000 and Sequester bonds with a market value of \$175,000. What changes would you need to make in your portfolio so that the return you will expect to earn will be unchanged after the firm's debt issue/equity repurchase?

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

a.  $\beta_U = \left(\frac{175}{175+300}\right) 0 + \left(\frac{300}{175+300}\right) 1.25$  (8)

b. Falls. Firm is promising (less risk-free cash flows) to the bondholders. These cash flows now go to the stockholders. (8)

c.  $r_E = r_U + \frac{125}{350} (r_U - 0.02)$  (8)  
 $r_U = \left(\frac{175}{175+300}\right) (0.02) + \left(\frac{300}{175+300}\right) (0.095)$  (10)

d. No change. Reason: a change in leverage changes how the firm's risk is distributed between debt and equity but does not change the risk of the firm's assets.

e.  $\Rightarrow$  buy \$50,000 of stock & sell 50,000 of debt

Reason: I currently own an unlevered position in Sequester with 0.1% of the firm's outstanding securities. After the change I need 0.1% of the firm's securities:  
 $\Rightarrow$  Debt = .001 (125 million) = 125,000  
 $\Rightarrow$  Equity = .001 (350 million) = 350,000