16-12 Build a Model - (WACC and Optimal Capital Structure)

Elliott Athletics is trying to determine its optimal capital structure, which now consists of only debt and common equity. The firm does not currently use preferred stock in its capital structure, and it does not plan to do so in the future. To estimate how much its debt would cost at different debt levels, the company’s treasury staff has consulted with investment bankers and, on the basis of those discussions, has created the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Market debt-to-value Ratio (wd) | Market equity-to-value Ratio (Wce) | Market debt-to-equity Ratio (D/S) | Bond Rating | Before-tax Cost of Debt (rd) |
|  |  |  |  |  |
| 0.0 | 1.0 | 0.00 | A | 7.0% |
| 0.2 | 0.8 | 0.25 | BBB | 8.0 |
| 0.4 | 0.6 | 0.67 | BB | 10.0 |
| 0.6 | 0.4 | 1.50 | C | 12.0 |
| 0.8 | 0.2 | 4.00 | D | 15.0 |

Elliot uses the CAPM to estimate its cost of common equity, rs. The company estimates that the risk-free rate is 5%, the market risk premium is 6%, and its tax rate is 40%. Elliot estimates that if it had no debt, its ‘unlevered” beta, bU, would be 1.2. Based on this information, what is the firm’s optimal capital structure, and what would the weighted average cost of capital (WACC) be at the optimal capital structure?

1. Plot a graph of the after-tax cost of debt, the cost of equity, and the WACC versus the debt/value ratio.
2. Would the optimal capital structure change if the unlevered beta changed? To answer this question, do a sensitivity analysis of WACC on bU for different levels of bU.