CASE 12.3 FINANCIALS AT CARCO[14]

You are the CFO for Carco, a small car rental company. You are trying to get some idea of what Carco's financial and income statements will look like during the current year (year 0) and the next five years. The following relationships hold:

- Current assets for each year are a "current assets factor" multiplied by the year's sales, where the current assets factors for different years are independent normal random variables with mean 0.15 and standard deviation 0.02.
- Each year, "fixed assets at cost" equals depreciation plus fixed assets.
- Accumulated depreciation in year 0 equals $330. For year t ($t \geq 1$), the depreciation equals the accumulated depreciation in year $t-1$ plus 10% of the fixed assets at cost for year $t-1$.
- Net fixed assets for year t equals a "net fixed assets factor" multiplied by year t sales, where the net fixed assets factors for different years are independent normal random variables with mean 0.77 and standard deviation 0.04.
- Total assets each year equals net fixed assets plus current assets.
- Current liabilities each year equals a "current liabilities factor" multiplied by the year's sales, where the current liabilities factor for different years are independent normal random variables with mean 0.08 and standard deviation 0.01.
- Long-term debt for year 0 is $280.
- For $t \geq 1$, the long-term debt for year t is the year t debt-equity ratio multiplied by the sum of year t retained earnings and the year t stock. Carco wants to have the following debt-equity ratios in years 1 through 5: 0.48, 0.46, 0.44, 0.42, and 0.40.
- Stock in year 0 is $450. For $t \geq 1$, year t stock equals the sum of year $t-1$ stock and year t new stock.
- Year 0 retained earnings equals $110. For $t \geq 1$, year t retained earnings is the sum of year $t-1$ retained earnings and year t retention.
- Each year, total liabilities is the sum of current liabilities, long-term debt, stock, and retained earnings.
- The amount of new stock issued each year must be enough to make total assets equal to total liabilities.
- The interest rate on current debt is 10.5%, and the interest rate on new debt is 9.5%. During each of the next five years, 20% of the current $280 in long-term debt must be paid off. Then the *total* amount of new debt during year t is the year t long-term debt minus the amount of initial debt still remaining.
- The new debt for year t equals the *total* new debt for year t minus the *total* new debt for year $t-1$.
- Year 0 sales equals $1000, and for $t \geq 1$, year t sales equals a "sales factor" multiplied by year $t-1$ sales, where the sales factors for different years are independent normal random variables with mean 1.1 and standard deviation 0.05. (This does *not* mean that sales during successive years are independent!)
- Year t expense equals an "expense factor" multiplied by year t sales, where the expense factors for different years are independent normal random variables, with mean 0.80 and standard deviation 0.06.
- To calculate yearly interest payments, remember that interest is 10.5% on old debt and 9.5% on new debt.
- Depreciation for year 0 is $0, and for $t \geq 1$, year t depreciation is 10% of the year $t-1$ fixed assets at cost.
- The before-tax profit each year is the sales minus the sum of expenses, interest payments, and depreciation.
- The tax rate is 47%.
- Dividends each year are 70% of after-tax profits.
- Retention each year is 30% of after-tax profits.

Set up a spreadsheet to model the current year (year 0) and next five years of Carco's financial future. Now simulate the firm's future. Use your output to answer the following questions. (*Note:* Your spreadsheet is allowed to contain circular references. There are many of these. For example, stock purchased each year depends on long-term debt, and long-term debt depends on stock. To resolve the circular references, use the Tools/Options menu item,

[14] This case is based on Benninga (1989).

click on the Calculations tab, check the Iterations box, and enter 20 as the Maximum Number of Iterations. This ensures that the spreadsheet will recalculate itself 20 times, which in turn ensures that the values in the spreadsheet will converge to the correct values.)

Questions

1. There is only a 5% chance that total new debt will exceed what value?
2. On the average, total interest payments for the next five years will equal what value?
3. What is the probability that profit will be negative during year 5? ■