

Finance and Valuing Investments

Physics and Mathematics of Sustainable Energy

College of the Atlantic

You are considering purchasing a bagel business. Here is the **basic scenario**:

- You expect that you will sell 1000 bagels in the first year, 1500 bagels in years two and three, and 2000 in years four and five.
 - The bagel machine is expected to last only five years. You can buy the business for \$10000.
 - You think you can sell the bagels for \$1.50.
1. Build a spreadsheet that will let you analyze this situation. I'll step you through this on the screen.
 2. What is the NPV of this investment if the discount rate is 5 percent?
 3. What is the NPV of this investment if the discount rate is 15 percent?
 4. Determine the IRR of this investment.
 5. Write a function that calculates the ROI for this investment.
 6. Suppose that instead of the basic scenario, the business will run for seven years instead of three, and you expect to sell 2000 bagels in years six and seven. Without doing any calculations, on a spreadsheet or otherwise, answer the following questions:
 - (a) Will the ROI for this investment increase, decrease, or stay the same?
 - (b) Will the IRR for this investment increase, decrease, or stay the same?
 - (c) Will the Payback time for this investment increase, decrease, or stay the same?
 7. Now suppose that instead of the basic scenario, you will sell 1000 bagels in year five instead of 2000. Without doing any calculations, on a spreadsheet or otherwise, answer the following questions:
 - (a) Will the ROI for this investment increase, decrease, or stay the same?
 - (b) Will the IRR for this investment increase, decrease, or stay the same?
 - (c) Will the Payback time for this investment increase, decrease, or stay the same?
 8. Oops. Turns out you forgot about taxes. You will need to pay 20% of your revenue each year in state and federal taxes. Under this assumption (and keeping the assumption that your business will run for five years, calculate:
 - (a) ROI
 - (b) IRR
 - (c) Payback time

Put the value for the tax rate in a separate cell, as I did with discount rate. This way you can easily experiment and change the tax rate and see what happens. And I'd suggest making a separate column for Revenue After Taxes.