

32. **Project Evaluation [LO1]** Aguilera Acoustics, Inc. (AAI), projects unit sales for a new seven-octave voice emulation implant as follows:

Year	Unit Sales
1	81,000
2	94,000
3	108,000
4	103,000
5	84,000

Production of the implants will require \$1,600,000 in net working capital to start and additional net working capital investments each year equal to 15 percent of the projected sales increase for the following year. Total fixed costs are \$1,500,000 per year, variable production costs are \$265 per unit, and the units are priced at \$380 each. The equipment needed to begin production has an installed cost of \$21,000,000. Because the implants are intended for professional singers, this equipment is considered industrial machinery and thus qualifies as seven-year MACRS property. In five years, this equipment can be sold for about 20 percent of its acquisition cost. AAI is in the 35 percent marginal tax bracket and has a required return on all its projects of 18 percent. Based on these preliminary project estimates, what is the NPV of the project? What is the IRR?

33. **Calculating Required Savings [LO2]** A proposed cost-saving device has an installed cost of \$730,000. The device will be used in a five-year project but is classified as three-year MACRS property for tax purposes. The required initial net working capital investment is \$55,000, the marginal tax rate is 35 percent, and the project discount rate is 9 percent. The device has an estimated Year 5 salvage value of \$80,000. What level of pretax cost savings do we require for this project to be profitable?
34. **Financial Break-Even Analysis [LO2]** To solve the bid price problem presented in the text, we set the project NPV equal to zero and found the required price using the definition of OCF. Thus the bid price represents a financial break-even level for the project. This type of analysis can be extended to many other types of problems.
- a. In Problem 18, assume that the price per carton is \$17 and find the project NPV. What does your answer tell you about your bid price? What do you know about the number of cartons you can sell and still break even? How about your level of costs?
 - b. Solve Problem 18 again with the price still at \$17, but find the quantity of cartons per year that you can supply and still break even. *Hint:* It's less than 120,000.
 - c. Repeat (b) with a price of \$17 and a quantity of 120,000 cartons per year, and find the highest level of fixed costs you could afford and still break even. *Hint:* It's more than \$325,000.
35. **Calculating a Bid Price [LO3]** Your company has been approached to bid on a contract to sell 4,200 voice recognition (VR) computer keyboards per year for four years. Due to technological improvements, beyond that time they will be outdated and no sales will be possible. The equipment necessary for the production will cost \$3.8 million and will be depreciated on a straight-line basis to a zero salvage value. Production will require an investment in net working capital of \$95,000 to be returned at the end of the project, and the equipment can be sold for \$275,000

at the end of production. Fixed costs are \$640,000 per year, and variable costs are \$155 per unit. In addition to the contract, you feel your company can sell 9,500, 10,400, 12,500, and 9,800 additional units to companies in other countries over the next four years, respectively, at a price of \$310. This price is fixed. The tax rate is 40 percent, and the required return is 10 percent. Additionally, the president of the company will undertake the project only if it has an NPV of \$100,000. What bid price should you set for the contract?

36. **Replacement Decisions [LO2]** Suppose we are thinking about replacing an old computer with a new one. The old one cost us \$1,300,000; the new one will cost, \$1,560,000. The new machine will be depreciated straight-line to zero over its five-year life. It will probably be worth about \$300,000 after five years.
- The old computer is being depreciated at a rate of \$260,000 per year. It will be completely written off in three years. If we don't replace it now, we will have to replace it in two years. We can sell it now for \$420,000; in two years, it will probably be worth \$120,000. The new machine will save us \$290,000 per year in operating costs. The tax rate is 38 percent, and the discount rate is 12 percent.
- a. Suppose we recognize that if we don't replace the computer now, we will be replacing it in two years. Should we replace now or should we wait? *Hint:* What we effectively have here is a decision either to "invest" in the old computer (by not selling it) or to invest in the new one. Notice that the two investments have unequal lives.
 - b. Suppose we consider only whether we should replace the old computer now without worrying about what's going to happen in two years. What are the relevant cash flows? Should we replace it or not? *Hint:* Consider the net change in the firm's aftertax cash flows if we do the replacement.

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Conch Republic Electronics, Part 1

Conch Republic Electronics is a midsized electronics manufacturer located in Key West, Florida. The company president is Shelley Couts, who inherited the company. When it was founded over 70 years ago, the company originally repaired radios and other household appliances. Over the years, the company expanded into manufacturing and is now a reputable manufacturer of various electronic items. Jay McCanless, a recent MBA graduate, has been hired by the company's finance department.

One of the major revenue-producing items manufactured by Conch Republic is a smart phone. Conch Republic currently has one smart phone model on the market, and sales have been excellent. The smart phone is a unique item in that it comes in a variety of tropical colors and is preprogrammed to play Jimmy Buffett music. However, as with any electronic item, technology changes rapidly, and the current smart phone has limited features in comparison with newer models. Conch Republic spent \$750,000 to develop a prototype for a new smart phone that has all the features of the

existing smart phone but adds new features such as WiFi tethering. The company has spent a further \$200,000 for a marketing study to determine the expected sales figures for the new smart phone.

Conch Republic can manufacture the new smart phones for \$185 each in variable costs. Fixed costs for the operation are estimated to run \$5.3 million per year. The estimated sales volume is 74,000, 95,000, 125,000, 105,000, and 80,000 per year for the next five years, respectively. The unit price of the new smart phone will be \$480. The necessary equipment can be purchased for \$38.5 million and will be depreciated on a seven-year MACRS schedule. It is believed the value of the equipment in five years will be \$5.4 million.

As previously stated, Conch Republic currently manufactures a smart phone. Production of the existing model is expected to be terminated in two years. If Conch Republic does not introduce the new smart phone, sales will be 80,000 units and 60,000 units for the next two years, respectively. The price of the existing smart phone is \$310 per unit, with