Study Problems

11-4  (Cash Flow and New Project Analysis) The Chung Chemical Corporation is considering the purchase of a chemical analysis machine. Although the machine being considered will not produce any increase in sales revenues, it will result in a before-tax reduction in labor costs of $35,000 per year. The machine has a purchase price of $100,000, and it would cost an additional $5,000 after tax to install this machine properly. In addition, to operate this machine properly, inventory must be increased by $5,000. This machine has an expected life of 10 years, after which it will have no salvage value. Also, assume simplified straight-line depreciation and that this machine is being depreciated down to zero, a 34-percent marginal tax rate, and a required rate of return of 15 percent.

a. What is the initial outlay associated with this project?

b. What are the annual after-tax cash flows associated with this project for years 1 through 9?

c. What is the terminal cash flow in year 10 (i.e., what is the annual after-tax cash flow in year 10 plus any additional cash flows associated with termination of the project)?

d. Should this machine be purchased?

11-5  (Cash Flow and New Project Analysis) Raymobile Motors is considering the purchase of a new production machine for $500,000. Although the purchase of this machine will not produce any increase in sales revenues, it will result in a before-tax reduction of labor costs by $150,000 per year. To operate this machine properly, workers would have to go through a brief training session that would cost $25,000 after tax. In addition, it would cost $5,000 after tax to install this machine properly. Also, because this machine is extremely efficient, its purchase would necessitate an increase in inventory of $30,000. This machine has an expected life of 10 years, after which it will have no salvage value. Assume simplified straight-line depreciation and that this machine is being depreciated down to zero, a 34-percent marginal tax rate, and a required rate of return of 15 percent.

a. What is the initial outlay associated with this project?

b. What are the annual after-tax cash flows associated with this project for years 1 through 9?

c. What is the terminal cash flow in year 10 (i.e., what is the annual after-tax cash flow in year 10 plus any additional cash flows associated with termination of the project)?

d. Should this machine be purchased?

11-6  (Cash Flow and Capital-Budgeting Analysis) The Jabot Cosmetics Corporation is considering replacing a 10-year-old machine that originally cost $30,000, has a current book value of $10,000 with 5 years of expected life left, and is being depreciated using the simplified straight-line method over its 15-year expected life down to a terminal value of zero in 5 years, generating depreciation of $2,000 per year. The replacement machine being considered would cost $80,000 and have a 5-year expected life over which it would be depreciated using the simplified straight-line method down to zero. At termination in 5 years the new machine would have a salvage value of $40,000. Material efficiencies resulting from the replacement would result in savings of $30,000 per year before depreciation and taxes. Currently, the old machine could be sold for $15,000. Assuming simplified straight-line depreciation , a 34-percent marginal tax rate, and a required rate of return of 20 percent, calculate.

a. The payback period

b. The net present value

c. The profitability index

d. The internal rate of return