

Demonstration Problem 5-1 Solution

a. Present value of cash flow savings

Annual Savings	x	Present Value Table Factor	=	Present Value
\$12,500	x	3.790787 ¹	=	\$47,385

¹Table 2, n=5, r=10%

b.

Net present value of modernization project	
Present value of cash flow savings (part a)	\$47,385
Cost of modernization	-45,000
Net present value	\$ 2,385

c.

Net present value of investing in new machine				
Present Value of Cash Inflows				
Future Value	x	Present Value Table Factor	=	Present Value
\$15,000 annual cash inflow	x	3.790787 ¹	=	\$56,862
\$4,000 salvage value	x	.620921 ²	=	2,484
Present value of cash inflows				59,346
Cost of new machine				-56,500
Net present value				\$ 2,846

¹Table 2, n=5, r=10%

²Table 1, n=5, r=10%

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d.

Present value index for modernization project				
Present Value of Cash Inflows	=	\$47,385	=	1.053
Present Value of Cash Outflows		\$45,000		

Present value index for investing in new machine				
Present Value of Cash Inflows	=	\$59,346	=	1.050
Present Value of Cash Outflows		\$56,500		

The higher present value index for the modernization project indicates that it will produce a higher internal rate of return than investing in the new machine.

Demonstration Problem 5-2 Solution

a. b. Payback period:

Cash Cost of Investment ÷ Annual Cash Inflow = Payback				
Van				
\$24,000	÷	\$12,000	=	2 years
Car				
\$16,000	÷	\$10,000	=	1.6 years

c. Because the car has a shorter payback period, it is the better alternative if payback is the sole investment criteria.

d. Although the payback method is easy to understand and apply, it fails to recognize the time value of money, measure profitability, or consider the life of the investment. Methods that include these evaluations might lead to a different decision.

e. First, determine the average annual increase in net income:

	Van	Car
Revenue	\$12,000	\$10,000
Depreciation Expense*	4,800	5,333
Increase in Net Income	\$ 7,200	\$ 4,667

*Van: \$24,000 ÷ 5 years = \$4,800 per year

Car: \$16,000 ÷ 3 years = \$5,333 per year

Next, determine the unadjusted rate of return:

Increase in Annual ÷ Cost of Investment = Unadjusted Rate Net Income of Return				
Van				
\$7,200	÷	\$24,000	=	30%
Car				
\$4,667	÷	\$16,000	=	29.2%