

True or False

6. The total project approach calculates the future value of cash outflows and inflows that differ between the alternatives of using the old machine and replacing the old machine.

7. The incremental approach calculates the present value of all cash inflows and outflows under each alternative.

8. Deflation can be defined as the decline in the general purchasing power of the monetary unit.

9. The nominal rate of return is the rate of return demanded to cover investment risk.

10. The real rate of return is the rate of return which deals with the inflation element.

11. Companies may vary the required payback when it is a project-selection criterion in order to reflect different levels of project risk.

16. The three factors that influence depreciation are typically covered by tax rules in most countries. These three factors are

a. amount allowable for depreciation, allowable life of asset, and amount of salvage value.

b. amount allowable for depreciation, allowable life of asset, and allowable methods of depreciation.

c. amount of asset, salvage value, and maximum tax rate.

d. estimated life of asset, maximum tax rate, and amount of investment tax credit.

17. In countries with very high inflation, indexing depreciable assets allows the depreciation deduction to be

a. insignificant when compared with the dollar value of the asset.

b. significant when compared with the dollar value of the asset.

c. the shortest time possible.

d. taxable.

21-24, 47. For 19x1 through 19x6, Better Product Company had annual net income of \$20,000, depreciation of \$40,000 each year, a 40 percent tax rate, a discount rate of 10 percent and annual cash sales of \$200,000. The depreciable assets of Better Product Company have a salvage value of zero at the end of six years and were all bought new at the beginning of 19x1.

21. What is the expense deduction for depreciation?

a. \$16,000 b. \$24,000 c. \$36,000 d. \$40,000

22. What is the annual tax savings from depreciation?

a. \$16,000 b. \$24,000 c. \$36,000 d. \$54,000

23. What is the present value of the tax savings from depreciation?

a. \$ 59,520 b. \$ 69,600 c. \$104,400 d. \$174,000

24. What are the annual net cash flows before taxes?

a. \$6,000 b. \$10,000 c. \$73,333 d. \$80,000

47. What was the after-tax cost of buying and using the depreciable assets for their useful lives?

a. \$ 64,000 b. \$144,000 c. \$160,000 d. \$170,400

25, 49, 50. Cozy Corners bought a new cash register computer costing \$20,000 on January 2, 19x1. On January 9, a computer representative made a sales call and told the owners about a new computer just on the market. She told them that their current machine's value was, maybe, \$5,000. Both machines will be depreciated over four years using the straight-line method for tax purposes. The incremental costs of operating the current machine over four years is \$15,000 annually, excluding depreciation. The new replacement machine can be purchased now for \$25,000. It can be operated for \$7,500 a year, excluding depreciation. The company's tax rate is 40 percent. Neither machine has a salvage value at the end of the four years. The company has a discount rate of 10 percent.

25. What is the total present value of the relevant cash flows for the current machine using the total project approach?

a. \$41,210 b. \$47,550 c. \$53,890 d. \$80,000

49. What is the total present value of the relevant cash flows for the proposed machine using the total project approach?

a. \$24,000 b. \$35,000 c. \$45,700 d. \$56,700

50. What is the net present value and which machine does it favor using the incremental cost approach?

- a. \$8,190, favoring new machine
- b. \$8,190, favoring current machine
- c. \$7,000, favoring new machine
- d. \$2,810, favoring current machine

59. Al Green, CPA, bought a new tax software package costing \$10,500 as tax preparation season was starting. After two days of operations a software salesperson stopped by with a new package. She said our current package was worthless and maybe would bring \$1,000 to a small one-person tax office. The software package can be amortized over three years using the straight-line method. The incremental costs of operating the software is \$5,000 during year one, \$6,000 during year two, and \$4,000 during the last year; each amount excludes amortization. The new software can be purchased and installed immediately for \$12,000. It also has a useful life of three years and can be operated for \$6,000 a year, excluding depreciation. The company's tax rate is 30 percent. Neither package has a resale value at the end of the three years.

Required:

- a. Calculate the relevant cash flows using both a total project approach and an incremental approach if the company's internal rate of return is 8 percent.
- b. What is the difference between the two methods?

60. The strategic planning manager of Sports Discount Stores cannot decide how to project the real costs of opening a new store. He knows the capital investment that will be made but is not sure of the returns. In the retail business, he knows there will be inflation most of the time. Both the selling prices and operating costs will increase to some degree. Sports Discount Stores has a required rate of return of 15 percent. It is anticipated that inflation will be 4 percent during the next few years. The company expects a new store to show a growth rate, without inflation, of 10 percent. First-year sales are expected to be about \$500,000.

Required:

a. What is the nominal rate of return for Sports Discount Stores?

b. What will be the sales figure for year three, assuming the strategic planner uses the real rate approach?

c. What will be the sales figure for year three, assuming the strategic planner uses the nominal rate approach?

61. Diamonds Incorporated is a trader of diamonds. In recent years, new uses for diamonds have produced a very high inflation rate of 20 percent in South Africa. The company has decided to use a nominal rate to determine capital budgeting decisions. Its long-term real rate of return is 10 percent. The company is planning on purchasing a piece of cleaning equipment that costs \$90,000. It is anticipated the equipment will generate savings in nominal dollars as follows:

Year 1 \$24,000 Year 2 30,000 Year 3 38,000

The anticipated salvage value of the equipment at the end of three years is \$40,000. South Africa taxes all corporations at 40 percent. Diamonds Incorporated uses straight-line depreciation for tax purposes for all equipment.

Required:

Compute the net present value of the equipment if the nominal rate of return is used.

62. Good Bread Bakery installed an oven costing \$100,000 on January 1, 19x1. Due to unexpected advances in technology, the equipment's value was reduced to \$24,000 in only one week. The equipment can be depreciated over four years for tax purposes using the straight-line method. The incremental costs of operating the oven over four years is \$80,000 annually, excluding depreciation. A new replacement machine with all the new advances can be purchased now for \$120,000. It also has a useful life of four years and can be operated for \$30,000 a year, excluding depreciation. The company's tax rate is 40 percent. Neither oven has a salvage value at the end of the four years.

Required:

a. Calculate the relevant cash flows, using both a total project approach and an incremental approach, if the company's internal rate of return is 10



percent.

b. What is the difference between the two methods?

Answers

6.False

7.False

8.False

9.False

10.False

11.True

16.b

17.b

21.d \$40,000 - given in problem

22.a $(\$40,000 \times 0.40) = \$16,000$

23.b $\$40,000 \times 0.40 \times 4.35 = \$69,600$

24.c

Before taxes net income \$33,333

Taxes 13,333

Net income \$20,000

Cashflow = $\$33,333 + \$40,000 = \$73,333$

47.d Asset base = 6 years x \$40,000 = \$240,000

Present value of tax savings of depreciation
= $\$16,000 \times 4.35 = \$69,600$

After-tax cost = $\$240,000 - \$69,600 = \$170,400$

25.c

Current machine:	Cash flows	Factor	PV
Operating costs	\$15,000	$\times 3.17 =$	\$ 47,550
Dep. tax savings $0.4 \times \$20,000/4 =$	2,000	$\times 3.17 =$	<u>6,340</u>
Total present value			\$ 53,890

49.c Replacement machine:	Cash flows	x Factor	PV
Purchase of new machine	\$25,000	$\times 1.00 =$	\$ 25,000
Operating costs	7,500	$\times 3.17 =$	23,785
Dep. tax savings = $0.4 \times \$25,000/4 =$	2,500	$\times 3.17 =$	7,925
After-tax savings current machine	(11,000)	$\times 1.00 =$	<u>(11,000)</u>
Total present value			\$ 45,700

Disposal of current machine:

Book value	\$20,000
Salvage value	<u>5,000</u>
Loss	\$15,000
Tax rate	<u>$\times 0.40$</u>
Tax savings	\$ 6,000
Cash from salvage	<u>5,000</u>
After-tax cash flow	\$11,000

50.a Incremental approach:	Cash flows	x Factor	PV
Purchase of new machine	$\$(25,000)$	$\times 1.00 =$	$\$(25,000)$
After-tax savings current machine	11,000	$\times 1.00 =$	11,000
Net operating advantage of new:			
\$15,000 - \$7,500	7,500	$\times 3.17 =$	23,775
Net depreciation tax savings of old:			
$\$25,000 - \$20,000 = \$5,000$			
$\$5,000/4 \times 0.40 = \500	(500)	$\times 3.17 =$	<u>(1,585)</u>
Net present value of new over old			\$ 8,190

59.a. Total project approach:

Current software:	Cash flows	x Factor	PV
Operating costs:			
year 1	\$5,000	$\times 0.926 =$	\$ 4,630
2	6,000	$\times 0.857 =$	5,142
3	4,000	$\times 0.794 =$	3,176
Amort. tax savings $\$10,500/3 \times 0.30$	1,050	$\times 2.577 =$	<u>(2,706)</u>
Total present value			\$10,242

Replacement software:



Purchase price	$\$12,000 \times 1.000 =$	$\$12,000$
Operating costs	$6,000 \times 2.577 =$	$15,462$
Amort. tax savings $\$12,000/3 \times 0.30$	$(1,200) \times 2.577 =$	$(3,092)$
After-tax savings current software $(3,850) \times 1.000 =$		<u>$(3,850)$</u>
Total present value		$\$20,520$

Disposal of current software:

Book value	$\$10,500$
Salvage value	<u>$1,000$</u>
Loss	$\$9,500$
Tax rate	<u>$\times 0.30$</u>
Tax savings	$\$2,850$
Cash from salvage	<u>$1,000$</u>
After-tax cash flow	$\$3,850$

Incremental approach:	Cash flows x Factor	PV
Purchase of new software	$\$12,000 \times 1.000 =$	$\$12,000$
After tax savings current software	$(3,850) \times 1.000 =$	$(3,850)$
Net operating costs (New old):		
Year 1 (\$6,000 \$5,000)	$1,000 \times 0.926 =$	926
Year 2 (\$6,000 \$6,000)	$0 \times 0.857 =$	0
Year 3 (\$6,000 \$4,000)	$2,000 \times 0.794 =$	$1,588$
Net amortization tax savings of old:		
$\$12,000 - \$10,500 =$		$\$1,500$
$\$1,500/3 \times 0.30 = \150	$150 \times 2.577 =$	<u>(387)</u>
Net present value of old over new		$\$10,277$

b. The total approach shows each project separately, while the incremental approach nets the flows of the project per category. The dollar difference is zero.

60.a.

Real rate of return	0.150
Inflation rate	0.040
Combination (0.15 x 0.04)	0.006
Nominal rate	0.196

b. First year:	$\$500,000$
Second year: $\$500,000 \times 1.10 =$	$\$550,000$
Third year: $\$550,000 \times 1.10 =$	$\$605,000$

c. First year:	$\$500,000$
Second year: $\$500,000 \times 1.196 =$	$\$598,000$
Third year: $\$598,000 \times 1.196 =$	$\$715,208$

61. Real internal rate of return	0.10
Inflation rate	0.20
Combination (0.10 x 0.20)	0.02
Nominal rate	0.32

Equipment purchase:

Cash flows	Factor	PV
Costs	$\$80,000 \times 1.000 =$	$\$80,000$
Operating savings: year 1	$24,000 \times 0.758 =$	$(18,192)$
2	$30,000 \times 0.574 =$	$(17,220)$
3	$38,000 \times 0.435 =$	$(16,530)$
Amort. tax savings $\$90,000/3 \times 0.40$	$= 12,000 \times 1.767 =$	$(21,204)$
Net present value		$\$6,854$

62.a. Total project approach:

Current oven:	Cash flows	Factor	PV
Operating costs	$\$80,000 \times 3.170 =$		$\$253,600$
Dep. tax savings $\$100,000/4 \times 0.40 = 10,000 \times 3.170 =$			$31,700$
Total present value			$\$285,300$

Replacement oven:

Purchase of new oven	$\$120,000 \times 1.000 =$	$\$120,000$
Operating costs	$30,000 \times 3.170 =$	$95,100$
Dep. tax savings $\$120,000/4 \times 0.40 = 12,000 \times 3.170 =$		$38,040$
After-tax savings current machine $(54,400) \times 1.000 =$		$(54,400)$
Total present value		$\$198,740$

Disposal of current oven:

Book value	$\$100,000$
Salvage value	<u>$24,000$</u>
Loss	$\$76,000$
Tax rate	$\times 0.40$
Tax savings	<u>$\\$30,400$</u>
Cash from salvage	<u>$24,000$</u>
After-tax cash flow	$\$54,400$

Incremental approach:	Cash flows	Factor	PV
Purchase of new oven	$\$120,000 \times 1.000 =$		$\$120,000$



After-tax savings current machine	$(54,400) \times 1.000 =$	$(54,400)$
Net operating advantage of new:		
\$80,000 - \$30,000	$(50,000) \times 3.170 =$	$(158,500)$
Net depreciation tax savings of old:		
\$120,000 - \$100,000 = \$20,000		
$\$20,000 / 4 \times 0.40 = \$2,000$	$2,000 \times 3.170 =$	<u>6,340</u>
Net present value of new over old		\$ 86,560

b. The total approach shows each project separately while the incremental approach nets the flows of the project per category. The dollar difference is zero.