

3. **Calculating Payback.** Offshore Drilling Products, Inc., imposes a payback cutoff of three years for its international investment projects. If the company has the following two projects available, should it accept either of them?

Year	Cash Flow (A)	Cash Flow (B)
0	-\$38,000	-\$70,000
1	16,000	10,000
2	19,000	15,000
3	18,000	20,000
4	5,000	250,000

4. **Calculating AAR.** You're trying to determine whether or not to expand your business by building a new manufacturing plant. The plant has an installation cost of \$13 million, which will be depreciated straight-line to zero over its four-year life. If the plant has projected net income of \$1,210,000, \$1,720,000, \$1,465,000, and \$1,313,000 over these four years, what is the project's average accounting return (AAR)?
5. **Calculating IRR.** A firm evaluates all of its projects by applying the IRR rule. If the required return is 18 percent, should the firm accept the following project?

Year	Cash Flow
0	-\$90,000
1	35,000
2	43,000
3	40,000

6. **Calculating NPV.** For the cash flows in the previous problem, suppose the firm uses the NPV decision rule. At a required return of 9 percent, should the firm accept this project? What if the required return was 23 percent?
7. **Calculating NPV and IRR.** A project that provides annual cash flows of \$1,000 for eight years costs \$4,900 today. Is this a good project if the required return is 8 percent? What if it's 24 percent? At what discount rate would you be indifferent between accepting the project and rejecting it?
8. **Calculating IRR.** What is the IRR of the following set of cash flows?

Year	Cash Flow
0	-\$2,200
1	640
2	800
3	1,900

9. **Calculating NPV.** For the cash flows in the previous problem, what is the NPV at a discount rate of zero percent? What if the discount rate is 10 percent? If it is 20 percent? If it is 30 percent?
10. **NPV versus IRR.** Bates & Reid, LLC, has identified the following two mutually exclusive projects:

14. **Problems with Profitability Index.** The Curbo Computer Corporation is trying to choose between the following two mutually exclusive design projects:

Year	Cash Flow (I)	Cash Flow (II)
0	–\$30,000	–\$4,500
1	13,000	2,600
2	13,000	2,600
3	13,000	2,600

- If the required return is 9 percent and Curbo applies the profitability index decision rule, which project should the firm accept?
  - If the company applies the NPV decision rule, which project should it take?
  - Explain why your answers in (a) and (b) are different.
15. **Comparing Investment Criteria.** Consider the following two mutually exclusive projects:

Year	Cash Flow (A)	Cash Flow (B)
0	–\$210,000	–\$20,000
1	15,000	12,000
2	30,000	10,500
3	32,000	9,500
4	425,000	8,200

Whichever project you choose, if any, you require a 15 percent return on your investment.

- If you apply the payback criterion, which investment will you choose? Why?
  - If you apply the NPV criterion, which investment will you choose? Why?
  - If you apply the IRR criterion, which investment will you choose? Why?
  - If you apply the profitability index criterion, which investment will you choose? Why?
  - Based on your answers in (a) through (d), which project will you finally choose? Why?
16. **NPV and IRR.** Cuchia Company is presented with the following two mutually exclusive projects. The required return for both projects is 15 percent.

Year	Project M	Project N
0	–\$35,000	–\$420,000
1	10,000	180,000
2	21,000	200,000
3	15,000	170,000
4	14,000	110,000

- What is the IRR for each project?
- What is the NPV for each project?
- Which, if either, of the projects should the company accept?