ACCT 102 – Fundamentals of Accounting II
Chapter 24 – Capital Budgeting and Investment Analysis

METHOD	ADVANTAGES	DISADVANTAGES
Average Rate of Return	Easy to calculate Considers accounting income (often used to evaluate managers)	Ignores cash flows Ignores the time value of money
Cash Payback	Considers cash flows Shows when funds are available for reinvestment	Ignores profitability (accounting income) Ignores cash flows after the payback period Ignores the time value of money
Net Present Value	Considers cash flows and the time value of money	Assumes that cash received from the project can be reinvested at the rate of return Necessary to evaluate projects of unequal size using a present value index
Internal Rate of Return	Considers cash flows and the time value of money Ability to compare projects of unequal size	Requires complex calculations or trial-and-error methods Assumes that cash received from the project can be reinvested at the internal rate of return

Methods that Ignore Present Value:

$$\text{Average Rate of Return} = \frac{\text{Annual after-tax Net Income}}{\text{Annual Average Investment}}$$

$$\text{Cash Payback} = \frac{\text{Cost of Investment}}{\text{Annual Net Cash Flow}}$$

Present Value Methods:

$$\text{Net Present Value Method} = \text{Present Value of Net Cash Flows} - \text{Investment}$$

$$\text{Profitability Index} = \frac{\text{Net Present Value of Cash Flows}}{\text{Investment}}$$

Internal Rate of Return

Step 1: Compute the Present Value Factor for the investment

$$\text{Present Value Factor} = \frac{\text{Amount Invested}}{\text{Net Cash Flows}}$$

Step 2: Identify the discount rate (IRR) yielding the present value factor

INVESTMENT ANALYSIS

	Project A		Project B	
Cost.....	$560,000		$900,000	
Expected life.....	4 years		4 years	
Expected residual value...	$0		$0	
Expected returns	**Income**	**Net Cash Flow**	**Income**	**Net Cash Flow**
Year 1	$10,000	$150,000	$100,000	$325,000
Year 2	50,000	190,000	100,000	325,000
Year 3	80,000	220,000	100,000	325,000
Year 4	84,000	224,000	100,000	325,000

What is the Average Rate of Return for:

Project A

Project B

What is the Cash Payback for:

Project A

Project B

PRESENT VALUE PROBLEMS

1. What is the present value of $1,000 000 to be received 10 years from now, with interest compounded at 15% annually?

2. What is the present value of an annuity of $10,000 for 5 years at 12%?

3. How much cash would you need to invest in a money market account today in order to have $8,000 at the end of four years? Assume interest rates are 6%.

4. How much cash would you need to invest in a money market account today in order to be able to withdraw $8,000 per year at the end of each of the next four years? Assume interest rates are 6%.

5. Assume you won the grand prize in a sweepstakes. Would it be better to take your prize in $100,000 payments each year over the next ten years or $600,000 now? Interest rates are 10%.

CAPITAL INVESTMENT ANALYSIS

EXERCISE 1

Daily Inc. is considering the acquisition of a newly developed machine at a cost of $620,000. This machine is expected to have a useful life of 5 years and no residual value. Use of the new machine is expected to yield total income of $240,000 during the 5 years of its useful life and to provide an average annual net cash flow of $200,000. The minimum rate of return desired by Daily is 12%. The maximum cash payback period desired by Daily is 3 years.

Instructions: Using the information given, answer the following questions:

1) What average rate of return (based on the average investment) can Daily expect to achieve during the useful life of this machine

2) What is the expected cash payback period for this proposed expenditure?

3) Based on the analysis of average rate of return, should the management of Daily acquire the new machine?

4) Based on the expected cash payback period, should the management acquire the new machine?

EXERCISE 2

Crusty Corp. is evaluating two capital investment proposals, each requiring an investment of $250,000 and each with a six-year life and expected total net cash flows of $360,000.

Proposal 1 is expected to provide equal annual net cash flows of $60,000. Proposal 2 is expected to have the following unequal net cash flows:

Year 1	.....	$100,000	Year 4	.....	$45,000
Year 2	.....	80,000	Year 5	.....	45,000
Year 3	.....	70,000	Year 6	.....	20,000

Instructions: Determine the cash payback period for each proposal.

Proposal 1:

Proposal 2:

EXERCISE 3

Assume that Crusty Corp. is re-evaluating the two capital investment proposals described in Exercise 2 taking into consideration present value concepts.

Instructions: Determine the net present value for each proposal using a rate of 10%.

Proposal 1:

Proposal 2:

EXERCISE 4

The management of Argo Inc. has decided to use the internal rate of return method to analyze a capital investment proposal that involves an investment of $454,800 and annual net cash flows of $120,000 for each of the 5 years of useful life.

Instructions

(1) Determine the present value factor for an annuity of $1 which can be used in determining the internal rate of return.

(2) Using the factor determined in (1) and the present value of an annuity of $1 table, determine the internal rate of return for the proposal.

EXERCISE 5

Instructions

(1) Complete the following table using the net present value method to evaluate capital investment in new equipment.

Year	Present Value of 1 at 12%	Net Cash Flow	Present Value of Net Cash Flow
1	0.893	$80,000	$
2	0.797	60,000	
3	0.712	60,000	
4	0.636	60,000	
5	0.567	60,000	
Total		$320,000	$
Amount to be invested in equipment			$ 180,000
Excess of present value over amount to be invested			$

(2) Compute the present value index for the new equipment. (Round to two decimal places.)

(3) Based on the net present value method, should management acquire the new machine?