

## **REVIEW OF BASIC CONCEPTS PART 2**

### **WHAT WILL YOU LEARN?**

- ▶ What is the future value of a stream of cash flows?
- ▶ What is the present value of a stream of cash flows?
- ▶ What is an annuity?
- ▶ How do you find the present or future value of an annuity?

## EXAMPLE

- Suppose you would like to have \$50,000 in two years to start your new business idea. Impressed by your performance at work, your employer has just given you an annual bonus of \$42,000 today. If you can invest at 5% per year, will you have enough at the end of two years to start your new business?

## EXAMPLE (CONT'D)

## UNEVEN STREAM OF CASH FLOWS

- Suppose over the next four years, you will receive the following cash flows.

Year 1     \$3000

Year 2     \$2000

Year 3     \$4000

Year 4     \$1000

- How much will you have at the end of four years at  $t=4$ , if the opportunity cost of funds is 5%?

## EVEN STREAM OF CASH FLOWS

- What if the cash flows were all the same? Say \$3000 every year?

## ANNUITIES

- ▶ An annuity is a series of equal fixed payments for a specified number of periods.
- ▶ Annuity Compound Factor,  $ACF(r,n)$ , sums up the compounding factors for  $n$  payments at a constant interest rate  $r$ .

## GENERAL FORMULA FOR FUTURE VALUE OF AN ANNUITY

## SINKING FUND PROBLEM

- We can look for the “C” – the fixed equal payment – to accumulate to a target value.

## EXAMPLE

- Suppose you want to make sure you have \$1,000,000 when you retire in 35 years. What even annual payments would you have to make to get to your goal if you can earn 6% per year?

## **EXAMPLE (CONT'D)**

## **PRESENT VALUE OF A STREAM OF CASH FLOWS**

- ▶ How about we find the present value of a stream of cash flows?
- ▶ Suppose you will get \$2000 every year for four years. What is the present value of these cash flows if the opportunity cost of funds is 5%?

## GENERAL FORMULA FOR PRESENT VALUE OF AN ANNUITY

## LOAN PROBLEM

- The purchase price of the car you would like to buy is \$37,150. You want to take out a loan (100% financing) with a maturity of 60 months. The first loan payment will come in one month's time, and the interest rate is 4% per year, compounded monthly. What are the monthly car payments?

## COMPOUNDING PERIODS

- The phrase “the interest rate is 4% per year, compounded monthly” tells us what the interest rate is per compounding period is.

## LOAN PROBLEM SOLUTION



## SUMMARY

- ▶ You learned how to compute the present value and future value of a stream of cash flows such as annuities.