

## **REVIEW OF BASIC CONCEPTS PART 3**

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

- ▶ How do you find effective interest rates?
- ▶ How do you adjust for compounding periods?
- ▶ What is continuous compounding?

## 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 is.

## ANNUAL PERCENTAGE RATE (APR)

Select the Balance Transfer that's right for you

<b>5.99%</b> Promo APR Until 01/01/2018	<b>15.49%</b> Variable APR After 01/01/2018
on Balance Transfers <sup>(?)</sup> including direct deposits	
<b>Select Offer</b>	
Transfers Must Post By 05/08/2018	

**Offer:** • 5.99% Promotional APR on Balance Transfers.

• After this promotional offer ends, your standard variable APR for purchases of **15.49%** will be applied to any unpaid promotional balances. This APR will vary with the market based on the Prime Rate.

**Duration:** • Until 01/01/2018.

**Fee:** • \$5 or 3% of the amount of each transaction, whichever is greater.

## APR (ANNUAL PERCENTAGE RATE) VS EFFECTIVE RATES

- ▶ The interest rate was given as 4% per year, compounded monthly.
- ▶ This is not the effective interest rate.
- ▶ This is the stated interest rate (or sometimes called the APR on your credit card statement).
- ▶ How do we find the effective annual interest rate?

## EFFECTIVE INTEREST RATE

- ▶ Suppose the stated interest rate is 4% per year, compounded monthly.
- ▶ Let's find the effective annual rate.

## EFFECTIVE INTEREST RATE

- ▶ Let's calculate other effective rates.
  - ▶ effective 2-month rate
  - ▶ effective 3-month rate
  - ▶ effective 6-month rate
  - ▶ effective 18-monthly rate

## ANOTHER EXAMPLE

- ▶ What if  $r = 6\%$  per year, compounded semiannually?
- ▶ What is the effective annual rate?

## ANOTHER EXAMPLE

- ▶ What if  $r = 6\%$  per year, compounded semiannually?
- ▶ What is the effective annual rate?
- ▶ What about other effective rates?
  - ▶ effective six-month rate?
  - ▶ effective three-month rate?
  - ▶ effective 2-year rate (or 24-month rate) ?
  - ▶ effective 15-month rate?

## CONTINUOUS COMPOUNDING

- ▶ What if instead of every month, interest rate is compounded every instant, say continuously?

## SUMMARY

- ▶ Difference between stated interest rate and effective rate
- ▶ Compute effective rates
- ▶ Compute continuously compounded rate