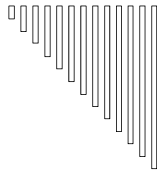


# Financial Management


**Chapter 8**  
 - Excerpts from part 1  
 - In-class cost of capital worksheet

Farm Management: Principles and Strategies, Kent Olson, 2003



# Calculating Loan Payments


Farm Management: Principles and Strategies, Kent Olson, 2003



## Amortized loans

- PI = principal and interest payment
- $PI_{(n,i)}$  = loan principal \* amortization factor  $_{(n,i)}$
- Amortization factor is based on the terms of the loan:
  - i = interest rate per period
  - n = number of periods (years \* payments/year)
  - Amortization factor  $_{(n,i)} = \{ i / [ 1 - (1 + i)^{-n} ] \}$

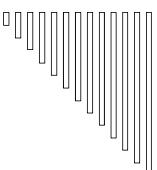
Farm Management: Principles and Strategies, Kent Olson, 2003



## Amortization example


- Loan principal = \$250,000
- Annual payments
- 20 years
- 8.5% annual interest rate
- Amortization factor  $_{(20,0.085)} = 0.1057$
- $PI_{(20,0.085)} = 250,000 * 0.1057 = \$26,425$

Farm Management: Principles and Strategies, Kent Olson, 2003



# Estimating the Cost of Credit

Farm Management: Principles and Strategies, Kent Olson, 2003



## Approximating the effective actual percentage rate (APR)

- Periodic loan payment  
 = net amount borrowed \*  
 amortization factor  $_{(n,i)}$
- So, the Amortization factor  $_{(n,i)}$   
 = periodic loan payment  
 net amount borrowed
- By looking at a table of amortization factors, the APR can be approximated

Farm Management: Principles and Strategies, Kent Olson, 2003

## APR approximation example

- In the previous example, the annual payment was \$26,425
- Net amount borrowed = \$247,250
  - 250,000 less 1% fee & \$250 fee
- Amortization factor = 0.1069  
= 26,425 / 247,250
- From an amortization factor table, the effective APR is approximated to be 8.66%

Farm Management: Principles and Strategies, Kent Olson, 2003

## Cost of Capital – In-class worksheet

- ✓ Suppose you want to buy the 160 acre farm across the road.
- ✓ For the different financing options below, estimate the approximate annual percentage rate (APR) after calculating the intermediate numbers in the table for each financing option.
- ✓ All options involve annual payments.
- ✓ Initially, your neighbors want \$2,400 per acre if you obtain financing from a bank or other institution.

Farm Management: Principles and Strategies, Kent Olson, 2003

1. A local bank is willing to provide a 30-year loan with these terms: 25% down, 10% annual interest, and loan origination fees and other non-interest charges equal to 1% of the loan.

Down payment	\$96,000
Original loan principal	\$288,000
Interest rate	10%
Amortization factor	
Annual payment	\$30,556.80
Non-interest finance charges	
Net amount borrowed	
Estimated amortization factor	0.1072
Estimated APR	10.1%

2. By comparison shopping, you find a regional bank that is willing to provide a 30-year loan with these terms: 25% down, 9.5% annual interest, and loan origination fees and other non-interest charges equal to 3% of the loan. (The land price is still \$2,400 per acre.)

Down payment	\$96,000
Original loan principal	
Interest rate	9.5%
Amortization factor	0.1017
Annual payment	
Non-interest finance charges	\$8,640
Net amount borrowed	
Estimated amortization factor	0.1048
Estimated APR	

3. After telling your local banker what the regional bank is offering, the local bank counters with a 30-year loan with these terms: 25% down, 9.3% annual interest, and loan origination fees and other non-interest charges equal to 5% of the loan. (The land price is still \$2,400 per acre.)

Down payment	
Original loan principal	
Interest rate	9.3%
Amortization factor	0.0999
Annual payment	
Non-interest finance charges	
Net amount borrowed	\$273,600
Estimated amortization factor	
Estimated APR	9.9%

4. Suppose your neighbors are willing to write a contract for deed for 25 years at 10.5% interest, if you agree to pay \$2,450 per acre with 20% down. They won't charge any non-interest finance charges.

Down payment	
Original loan principal	
Interest rate	10.5%
Amortization factor	0.1144
Annual payment	
Non-interest finance charges	\$0
Net amount borrowed	\$313,600
Estimated amortization factor	
Estimated APR	