

# Construction Accounting and Financial Management

Chapter 16  
Financing a Company's Financial Needs

## Simple Interest

- $I = P(i)n$   
- or -
- $I = P(i)D/365$   
where
  - $I$  = Interest
  - $P$  = Principal
  - $i$  = Interest rate per year
  - $n$  = Number of years (may be a fraction)
  - $D$  = Days

## Compound Interest

- $i = r/c$   
where
  - $i$  = Periodic interest rate (often monthly)
  - $r$  = Nominal interest rate per year or annual percentage rate (APR)
  - $c$  = Number of compounding periods in a year  
where  $c \geq 1$

## Compound Interest

- $i = (r/365)D$   
where
  - $i$  = Periodic interest rate
  - $r$  = Nominal interest rate per year or annual percentage rate (APR)
  - $r/365$  = Daily finance charge
  - $D$  = Number of days
- Often used for credit cards

## Yield or Annual Percentage Yield (APY)

- $i_a = (1 + r/c)^c - 1$   
where
  - $i_a$  = Yield
  - $r$  = Nominal interest rate per year or annual percentage rate (APR)
  - $c$  = Number of compounding periods in a year  
where  $c \geq 1$

## Interest Rate

- Fixed
  - Remains the same throughout the loan
- Variable
  - Can change at specified times during the loan
  - Usually tied to an index

## Payment on Long-Term Loans

- $$A = \frac{P[i(1+i)^n]}{[(1+i)^n - 1]}$$

where

$A$  = Monthly payment (excludes taxes and insurance)

$P$  = Principal

$i$  = Periodic interest rate for one month ( $r/12$ )

$n$  = Duration of loan in months

## Interest Paid Over the Life of the Loan

- $$I = An - P$$

where

$I$  = Total Interest paid

$A$  = Monthly payment

$n$  = Duration of loan in months

$P$  = Principal

## Interest for Month $t$

- $$I_t = U_{t-1}(i)$$

where

$I_t$  = Interest for month  $t$

$U_{t-1}$  = Outstanding principal at the end of month  $t-1$  (the previous month)

$i$  = Periodic interest rate for one month ( $r/12$ )

## Outstanding Principal at the End of Month $t$

- $$U_t = U_{t-1} + I_t - A$$

where

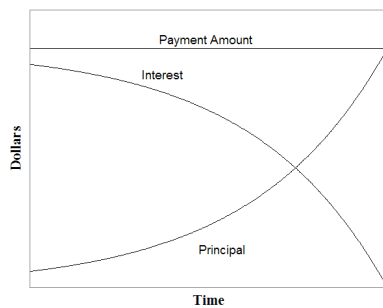
$U_t$  = Outstanding principal at the end of month  $t$

$U_{t-1}$  = Outstanding principal at the end of month  $t-1$  (the previous month)

$I_t$  = Interest for month  $t$

$A$  = Monthly payment

## Principal versus Interest



## Amortization Schedule

- Shows for each month:
  - Outstanding principal
  - Monthly interest
  - Monthly payment

APR: 9.00%						Page 1
Term: 360 Months						
Monthly Payment: \$1,206.93						
Month	Beginning Principal	Monthly Payment	Monthly Interest	Principal Reduction	Ending Principal	
0	150,000.00				150,000.00	
1	149,918.07	1,206.93	1,125.00	81.93	149,918.07	
2	149,835.53	1,206.93	1,124.39	82.54	149,835.53	
3	149,752.37	1,206.93	1,123.77	83.16	149,752.37	
4	149,668.58	1,206.93	1,123.14	83.79	149,668.58	

### Effective Annual Interest Rate with Closing Costs

- Closing costs increase effective annual interest rate
- Step 1: Determine payment ( $P$ )
- Step 2: Determine closing costs
- Step 3: Solve the following equation for  $i$ :
  - $A = \frac{(P - \text{Closing Costs})[i(1+i)^n]}{[(1+i)^n - 1]}$

### Effective Annual Interest Rate with Closing Costs and Early Payment

- Step 1: Determine payment ( $P$ )
- Step 2: Determine closing costs
- Step 3: Determine early payment
  - Outstanding principal balance ( $U_t$ )
- Step 4: Solve for  $i$  using the following equation:
  - $P = \frac{\text{Closing Costs} + A[(1+i)^t - 1]}{[i(1+i)^t]} + \frac{U_t}{(1+i)^t}$

### Interest on Short-Term Loans

- $i = [P/(P - I)] - 1$   
where
  - $i$  = Periodic interest rate (period = life of loan)
  - $P$  = Principal
  - $I$  = Total interest paid

### Interest on Short-Term Loans

- $i_a = (1 + i)^c - 1$   
where
  - $i_a$  = Yield
  - $i$  = Periodic interest rate (period = life of loan)
  - $c$  = Number of compounding periods per year  
where  $c \geq 1$

### Lines of Credits

- $I_t = ADB_t(i)$   
Where
  - $I_t$  = Interest due for period  $t$
  - $ADB_t$  = Average daily balance for period  $t$
  - $i$  = Periodic interest rate

### Compensating Balance

- Percentage of line of credit is placed in a low- or non-interest-bearing account
- Determining effective annual interest rate with compensating balance
  - Determine yield
  - Use yield to determine interest paid on funds
  - Determine effective annual interest rate

## Compensating Balance

- $i_a = I / (\text{Funds available})$   
where  
 $i_a$  = Yield  
 $I$  = Interest  
Funds available = Average daily balance –  
Compensating balance

## Commitment Fee

- Interest is paid on unused funds
- Determining effective annual interest rate with commitment fee
  - Determine yield
  - Use yield to determine interest paid on funds
  - Determine effective annual interest rate

## Commitment Fee

- $i_a = I / (\text{ADB})$   
where  
 $i_a$  = Yield  
 $I$  = Interest  
ADB = Average daily balance

## Other Forms of Financing

- Leasing
- Trade financing
- Credit cards
- Equity

## Selecting a Banker

- Complete package
- Specialize in the construction industry
- Size
- Convenient location

## Applying for a Loan

- Tax returns
- Financial statements
- Work on hand report
- Overhead budget
- Annual cash flow projection

---

## Applying for a Loan

- Project pro forma (for projects)
  - Business plan
  - References
-