Construction Accounting and Financial Management

Chapter 16
Financing a Company's Financial Needs

Simple Interest

- $I = P \times i \times n$

  - or -

- $I = P \times i \times D/365$

  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 (i/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

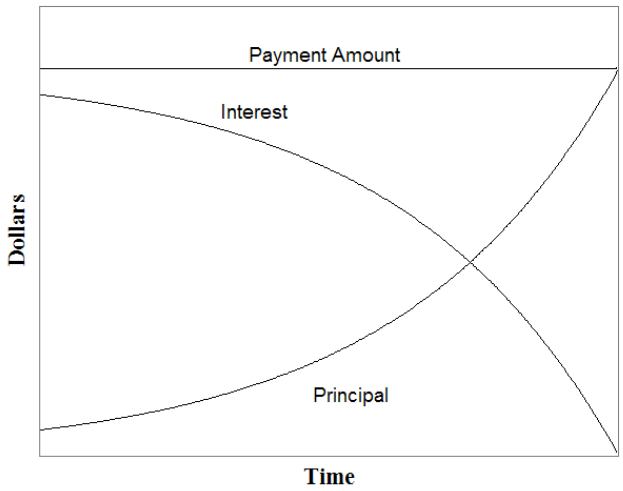
  U_t = Outstanding principal at the end of month t

  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
1	150,000.00	1,206.93	1,125.00	81.93	149,918.07
2	149,918.07	1,206.93	1,124.39	82.54	149,835.53
3	149,835.53	1,206.93	1,123.77	83.16	149,752.37
4	149,752.37	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

- $i_a = I$(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