15.511 Corporate Accounting Recitation 5

June 29, 2004

Accounting for Long Lived Assets

- ☐ The matching principle in action
    - ■ What dollar amount to capitalize?
    - ■ Over what time period should the asset be depreciated?
    - ■ At what rate should the asset be depreciated?
- ☐ Formulas
    - ■ $PPE_{EB} = PPE_{BB} + \text{Acquisitions} - \text{Disposals}$
    - ■ $AccDep_{EB} = AccDep_{BB} + \text{Depreciation} - AccDep_{Disposal}$
    - ■ Proceeds from sale (cash) = Net Book Value + gain/loss

Time value of money

- ☐ Cash flows arrive at different time periods. We cannot add cash flows today to cash flows tomorrow.

- ☐ Key tool to add cash flows: The *interest rate*, also called *discount rate, cost of capital* or *opportunity cost.*

- ☐ Interest rate is a convenient (standardized) way of expressing the cost of borrowing or profit of lending on a per-dollar and per unit of time basis.

Future value

☐ Intuition: *A dollar today is worth more than a dollar tomorrow*. Why?

☐ Suppose you can invest at 10%:
  - In one year $1 will become $1.10.
  - *Future value* in one year of *P* invested today at rate of return *r*: $P + rP = P(1 + r)$

☐ Future value = *initial payment + accumulated interest*

☐ In general the future value in *n* years of *P* invested today is: $FV = P(1 + r)...(1 + r) = P(1 + r)^n$
   $(1 + r)^n$ is called the *future value factor*.

Future value

- Example 1: Bank pays 8% interest on 5-year CD and you deposit $10,000. What will it be worth in 5 years?

  $$\$10,000 * (1 + 8\%)^5 = \$14,693$$

- Example 2: Which would you rather be given? (r = 8%) (a) $100 today; (b) $125 one year from today.

  Calculate the future value of (a):

  $100*(1+8%) = 108

Present value

- ☐ What is the value today of $100 received a year from now?

- ☐ How much would I need to save today in order to get $100 in one year?

- ☐ Consider saving *P* today. One year from now you receive: P*(1+r)=100

- ☐ The *present value* of $100 received one year from now is: 100/(1+r)

Present value

- ☐ With an interest rate of 6%, what is the PV of $100 received one year from now?
    - ■ PV=100/1.06=94.34

- ☐ What is the PV if r=10%?
    - ■ PV=100/1.1=90.91

Present value

☐ With an interest rate of 10%, what is the PV of $100 received two years from now?

$$PV = 100/(1+10\%)^2$$

☐ In general the present value of *F* received *n* years from now is: $PV = F/(1+r)^n$

■ The term $1/(1+r)^n$ is called present value factor.

☐ The higher the r, the longer the time horizon, the lower the present value.