## Capital Budgeting

## Capital Budgeting

- What is capital budgeting?
- How do compute the value of a bond?
- How do we compute the value of a share of stock?
- How do we compute the value of a project?


## Relevant Incremental Cash Flows

- Sunk Costs?
- Opportunity Costs?
- Side Effects?
- Changes in Net Working Capital?
- Taxes?
- Financing Costs?


## Project Cash Flows

# Net Working Capital 

- What is net working capital?
- Why include it?
- Is it a cash inflow ora cash outflow?
*Don't forget to recover net working capital at the end of the project.


## Net Working Capital

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## Salvage Value and Taxes

- How do we calculate the book value of an asset?
- What if we sell an asset formore than book value?


## Salvage Value and Taxes

- In year 4, we sell a machine for $\$ 1,000$. The book value of the machine is $\$ 800$. The tax rate is $30 \%$. What is the after-tax salvage value?


## Salvage Value and Taxes

- What if we sell an asset for less than book value?
- In year 4, we sell a machine for $\$ 1,000$. The book value of the machine is $\$ 1,200$. The tax rate is $30 \%$. What is the after-tax salvage value?


## Salvage Value and Taxes

- What if we sell an asset for less than book value?
- In year 4, we sell a machine for $\$ 1,000$. The book value of the machine is $\$ 1,200$. The ta $\times$ rate is $30 \%$. What is the after-tax salvage value?
- What if we sell an asset for book value?


## Depreciation

- Two different ways to calculate:
> Straight-Line Depreciation
MACRS


## Straight-Line Depreciation

- Annual depreciation expense $=$
(purchase price - ending book value) number of years
- You just bought a new machine for $\$ 15,000$, which can be depreciated to zero over 5 years. What is the annual depreciation expense if the firm uses straight-line depreciation?


## MACRS Depreciation

- How is it different from straight-line?
- Always depreciate to zero.
- Assumes asset is purchased halfway through first year.
© Property class assigned. Then use tables.


## MACRS Depreciation Table

| Year | 3 year | 5 year | 7 year |
| :---: | :---: | :---: | :---: |
| 1 | 33.33\% | 20.00\% | 14.29\% |
| 2 | 44.45\% | 32.00\% | 24.49\% |
| 3 | 14.81\% | 19.20\% | 17.49\% |
| 4 | 7.41\% | 11.52\% | 12.49\% |
| 5 |  | 11.52\% | 8.93\% |
| 6 |  | 5.76\% | 8.92\% |
| 7 |  |  | 8.93\% |
| 8 |  |  | 4.46\% |

# MACRS Depreciation: An Example 

- You just bought a new machine for \$15,000, which is in the 5-yearasset class. Create a MACRS depreciation schedule.


## Example \#1

You are considering the introduction of a new product, EasyBs, which will be on the market for 5 years. Last year, you spent $\$ 20,000$ on a market study to determine the appropriate price would be $\$ 5$ per unit. You expect sales to be 10,000 units in year 1 and grow by 2,000 units each year after. Costs are expected to be $20 \%$ of sales, and the firm's marginal tax rate is $40 \%$. In addition, you must purchase a manufa c turing ma chine for $\$ 100,000$, which is depreciated using MACRS (3-year class), and worthless at the end of the project. Due to an increase in inventories, net working capital is expected to increase by $\$ 15,000$. If the required retum on this project is $12 \%$, should you introduce EasyBs?

Capital Budgeting
$\square$

## Company Valuation

- How do we do it?
$\odot$ The main difference:


## Risk Analysis

- Sensitivity Analysis
- Scenario Analysis
- Simulations


## Chapter 10 <br> Suggested Problems

- Concepts Review and Critical Thinking Questions:
> 1, 2, 6, and 7
- Questions and Problems:
> $1,2,6,7,8,9,10,13,14,15$, and 31 (use a spreadsheet for problem 31).


## Example \#2

Aubum Industries is evaluating the option of purc hasing a fork-lift truck costing $\$ 60,000$. If purc ha sed, the truck will replace 4 workers, each with an average annual salary of $\$ 15,000$. However, an experienced fork-lift operator will have to be hired at a salary of $\$ 20,000$ peryear. Fuel and maintenance expense is expected to be \$10,000 per year. At the end of its 5 -year life, the truck will have a market value of $\$ 10,000$. Aubum Industries uses straightline depreciation and depreciates the asset to $\$ 0$, assigns a $10 \%$ required rate of retum for this type of investment, and has a marginal tax rate of $40 \%$. Should the fork-lift truck be purchased?

## Example \#3

A company is considering the acquisition of production equipment which will reduce both labor and materia ls costs. The cost is $\$ 100,000$ and it will be depreciated on a straightline basis down to $\$ 0$. The useful life of the equipment is five years, and it will have a $\$ 20,000$ market value at the end of five years. Operating costs will be reduced by $\$ 30,000$ in the first year and the savings will inc rease by $\$ 5,000$ per year in years 2,3 , and 4 . Due to increased maintenance costs, savings in year five will be $\$ 10,000$ less than the year four savings. The equipment will also reduce net working capital by $\$ 5,000$ throughout the life of the project. The firm's stax rate is 35 percent and the required retum is 16 percent. Should the fim purchase this production equipment?

## Example \#4

You have been asked by the president of your company to evaluate the proposed acquisition of a new flux capacitor for the firm's R\&D department. The equipment's basic price is $\$ 70,000$ and it would cost a nother $\$ 15,000$ to modify it for special use by your firm. The flux capacitor, which has a MACRS 3-year recovery period, would be sold after 3 years for $\$ 30,000$. Use of the equipment would require an increase in net working capital (spare parts inventory) of $\$ 4,000$. The flux capacitor would have no effect on revenues, but it is expected to save the firm $\$ 25,000$ per year in before-tax operating costs, mainly labor. The firm's marginal tax rate is 40 percent. If the project's cost of capital is 10 percent, should the flux capacitorbe purchased?

