# Chapter 9

Making Capital Investment Decisions

## Relevant Cash Flows

- The cash flows that should be included in a capital budgeting analysis are those that will only occur if the project is accepted
- These cash flows are called *incremental cash flows*
- The *stand-alone principle* allows us to analyze each project in isolation from the firm simply by focusing on incremental cash flows

## Asking the Right Question

- You should always ask yourself "Will this cash flow change ONLY if we accept the project?"
  - If the answer is "yes," it should be included in the analysis because it is incremental
  - If the answer is "no", it should not be included in the analysis because it is not affected by the project
  - If the answer is "part of it," then we should include the part that occurs because of the project

## Common Types of Cash Flows

- Sunk costs – costs that have accrued in the past
- Opportunity costs – costs of lost options
- Side effects
  - Positive side effects – benefits to other projects
  - Negative side effects – costs to other projects
- Changes in net working capital
- Financing costs
- Taxes

## Pro Forma Statements and Cash Flow

- Capital budgeting relies heavily on pro forma accounting statements, particularly income statements
- Computing cash flows – refresher
  - Operating Cash Flow (OCF) = EBIT + depreciation – taxes
  - OCF = Net income + depreciation when there is no interest expense
  - Cash Flow From Assets (CFFA) = OCF – net capital spending (NCS) – changes in NWC

## The Tax Shield Approach

- You can also find operating cash flows, using the tax shield approach
- OCF = (Sales – costs)(1 – T) + Depreciation*T
- This form may be particularly useful when the major incremental cash flows are the purchase of equipment and the associated depreciation tax shield – such as when you are choosing between two different machines

## Depreciation

- The depreciation expense used for capital budgeting should be the depreciation schedule required by the IRS for tax purposes
- Depreciation itself is a non-cash expense; consequently, it is only relevant because it affects taxes
- Depreciation tax shield = DT
  - D = depreciation expense
  - T = marginal tax rate

## Computing Depreciation

- Straight-line depreciation
  - D = (Initial cost – salvage) / number of years
  - Very few assets are depreciated straight-line for tax purposes
- MACRS
  - Need to know which asset class is appropriate for tax purposes
  - Multiply percentage given in table by the initial cost
  - Depreciate to zero
  - Mid-year convention

## After-tax Salvage

- If the salvage value is different from the book value of the asset, then there is a tax effect
- Book value = initial cost – accumulated depreciation
- After-tax salvage = salvage – T(salvage – book value)

## Replacement Problem – Computing Cash Flows

- Remember that we are interested in incremental cash flows
- If we buy the new machine, then we will sell the old machine

## Scenario Analysis

- What happens to the NPV under different cash flows scenarios?
- At the very least look at:
  - Best case – revenues are high and costs are low
  - Worst case – revenues are low and costs are high
  - Measure of the range of possible outcomes
- Best case and worst case are not necessarily probable; they can still be possible

## Sensitivity Analysis

- What happens to NPV when we vary one variable at a time
- This is a subset of scenario analysis where we are looking at the effect of specific variables on NPV
- The greater the volatility in NPV in relation to a specific variable, the larger the forecasting risk associated with that variable and the more attention we want to pay to its estimation

## Capital Rationing

- Capital rationing occurs when a firm or division has limited resources
  - Soft rationing – the limited resources are temporary, often self-imposed
  - Hard rationing – capital will never be available for this project
- The profitability index is a useful tool when faced with soft rationing