

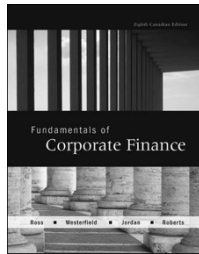
Finance for Management and Organizational Studies

MOS 2310

Chapter 10

Making Capital Investment Decisions

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Making Capital Investment Decisions

- Project Cash Flows: A First Look
- Incremental Cash Flows
- Pro Forma Financial Statements and Project Cash Flows
- More on Project Cash Flow
- Alternative Definitions of Operating Cash Flow
- Applying the Tax Shield Approach
- Some Special Cases of Cash Flow Analysis

Discount Incremental Cash Flows

Cash Flow Rules

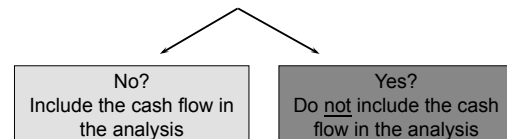
- Discount only incremental cash flows
- Include all indirect effects
- Ignore sunk costs
- Include opportunity costs
- Account for working capital investment
- Beware of allocated overhead costs



Discount Incremental Cash Flows: Flowchart

Look for Incremental Benefits

- A project's NPV depends on the extra cash flows it produces
- **Would this cash flow still exist if the project did not exist?**



Ignore Sunk Costs

- Sunk costs remain the same whether or not you accept the project. Therefore, they do not affect project NPV
- Sunk costs are like spilled milk: they are past and irreversible outflows!
- The way to identify a sunk cost is to see if it remains the same whether or not you accept the project



LO1 Common Types of Cash Flows 10.2

- 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 (e.g., inventory and receivables)
- Inflation (adjust discount rate and/or cash flows)
- Government Intervention (ITC, Taxes)
- Capital Cost Allowance (CCA)
- Do NOT include: Financing costs or Sunk costs

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Computing Operating Cash Flows (OCF)

- Basic Approach
 - $OCF = EBIT + \text{Depreciation} - \text{Taxes}$
- Bottom-Up Approach
 - Works only when there is no interest expense
 - $OCF = NI + \text{depreciation}$
- Top-Down Approach
 - $OCF = \text{Sales} - \text{Costs} - \text{Taxes}$
 - Don't subtract non-cash deductions
- Tax Shield Approach
 - $OCF = (\text{Sales} - \text{Costs})(1 - T_c) + \text{Depreciation} * T_c$

Investments in Working Capital (WC)

Account for Investments in Working Capital

- Net working capital is the difference between a firm's short-term assets and liabilities
- Most projects entail an additional investment in working capital (outflow)
- Example: At the end of the project, when inventories are sold and accounts receivable are collected, the firm has a cash inflow

LO1

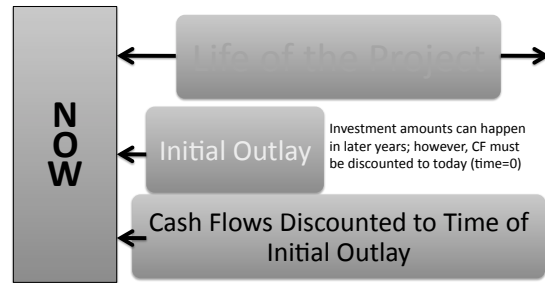
More on NWC 10.4

Why do we have to consider changes in NWC separately?

- GAAP requires that sales be recorded on the statement of comprehensive income when made, not when cash is received
- GAAP also requires that we record cost of goods sold when the corresponding sales are made, regardless of whether we have actually paid our suppliers yet
- Finally, we have to buy inventory to support sales although we haven't collected cash yet

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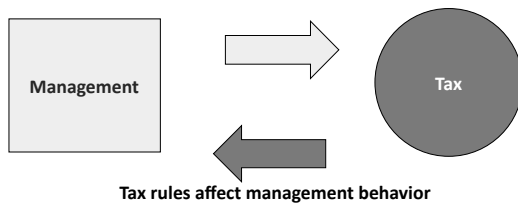
An Alternative Approach to Calculating Project Cash Flows



Taxes

"Trying to separate tax planning from business decision-making is like trying to solve two simultaneous equations, one at a time"

From *Managerial Tax Planning, A Canadian Perspective*, page 1



Tax Terminology

CCA: Capital cost allowance; represents the amount of 'depreciation for tax purposes' that can be deducted in a year

UCC: Un-depreciated capital cost; represents the balance remaining after yearly CCA is deducted for tax deductible investments

CCA rate: The rate of yearly depreciation for tax purposes

Capital cost classes: Classes of assets, each of which has a prescribed CAA rate

Segregation into Classes

For calculating CCA, assets are assigned to different **asset classes**

Importance

- These classes have specified CCA rates
- There are over 40 classes
- Class 8 contains all property that is tangible capital asset that is not included in another class
- Class 12 at 100 percent
- Class 1 at 4 percent
- Mistakes are Costly; Impact on taxable income and Tax Payable

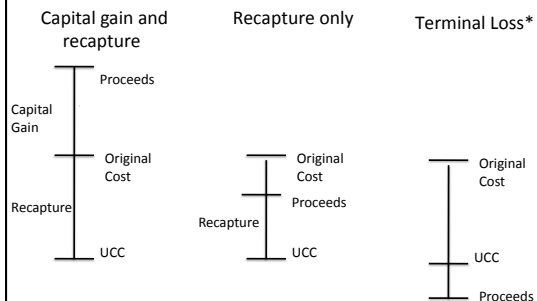
More Tax Terminology

Capital gain: recovery of capital greater than original cost

Recapture: represents recovery of previously deducted CCA; is the amount the selling price ("proceeds of disposal") exceeds UCC up to the original cost

Terminal loss: represents loss due to selling price being lower than UCC; in effect, CCA was insufficient

Recapture and Terminal Loss



Capital Budgeting and Taxes

- Depreciation is a non-cash expense and is not included directly in capital budgeting decisions
- Capital cost allowance (CCA) is a tax deductible expense which reduces taxes payable and therefore increases cash flows

	No CCA	With CCA	Change
NIBT	\$1,000	\$1,000	
CCA	0	400	400
Taxable Income	\$1,000	\$600	
Taxes (40%)	\$400	\$240	\$160

Tax Shield (or tax savings) due to CCA = CCA x tax rate
 = \$400 x .4 = \$160

More Tax Terminology

Tax Shield: represents tax benefit from purchasing a tax-deductible asset

Salvage value: (also known as disposal value or terminal value) is the expected cash proceeds when investment is sold, often at the end of its useful life

½ Year rule: CRA's rule that only allows us to figure CCA on only half of the assets installed cost in the first year it is put in use

LO4

Computing Tax Depreciation

- Need to know which asset class is appropriate for tax purposes
- Straight-line depreciation
 - $D = (\text{Initial cost} - \text{salvage}) / \text{number of years}$
 - Very few assets are depreciated straight-line for tax purposes
- Declining Balance
 - Multiply percentage given in CCA table by the un-depreciated capital cost (UCC)
 - Can use PV of CCA Tax Shield Formula:

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PVCCATS [Text]

$$= \left[\frac{IdTc}{d+k} \right] \left[\frac{1+0.5k}{1+k} \right] - \left[\frac{S_n dTc}{d+k} \right] X \left[\frac{1}{(1+k)^n} \right]$$

where:

- I = Total capital investment in the asset which is added to the pool
- d = CCA rate for the specified asset class
- Tc = firm's corporate marginal tax rate
- k = discount rate
- S = salvage value from sale of asset, year n

Present Value of CCA Tax Shield

$$C \left[\frac{d^* Tc}{d+k_a} \right] \left[\frac{1+0.5k_a}{1+k_a} \right] - S_0 \left[\frac{d^* Tc}{d+k_a} \right]$$

where:

- C = NET capital cost of asset acquired today
- d = CCA rate for the specified asset class
- Tc = firm's corporate marginal tax rate
- k_a = discount rate (WACC)
- S₀ = salvage value from sale of asset at the time zero

Present Value of the CCA Tax Shield Equation

1. Present value of tax shield from now to infinity

$$C \left[\frac{d * Tc}{d + k_a} \right] \left[\frac{1 + 0.5k_a}{1 + k_a} \right] = \text{PV of tax shield (savings) on CCA}$$

Adjustment for half year rule

This section calculates the total PV of the tax shield assuming the asset is held in perpetuity

PV of the CCA Tax Shield Lost

2. Present value of tax shield lost on salvage

$$S_0 \left[\frac{d * Tc}{d + k_a} \right]$$

This section calculates the PV (@ time of sale) of the tax shield you give up when you sell the asset

NPV Decision Process

1. Forecast the future project cash flows, noting when the flow occurs
2. Estimate the opportunity cost of capital (later chapters)
3. Calculate the present value of the future cash flows discounted at the opportunity cost of capital rate
4. NPV Decision Rule: The present value sum of the future cash flows *minus* the investment outlay is the **net present value**. If the net present value is positive (greater than zero), make the investment.

Capital Budgeting Framework

Initial Investment of the project

- Net out any old equipment/investment
- +/- Working Capital
- If it is an outflow now then when recovered will be an inflow
- /+ Working Capital Recovery (end of the project) This is the opposite of the above
- + Tax Shield
- + PV of the Salvage Value
- Tax Shield Lost (on disposal)
- + Cash Flows INCREMENTAL and AFTER TAX
- =NPV If + = accept; If "-" = reject