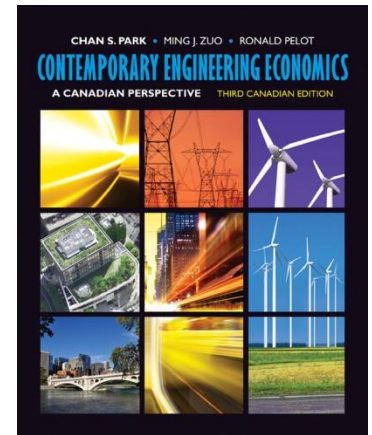


Capital Cost Allowance for Income Tax



Lecture No. 24

Chapter 8

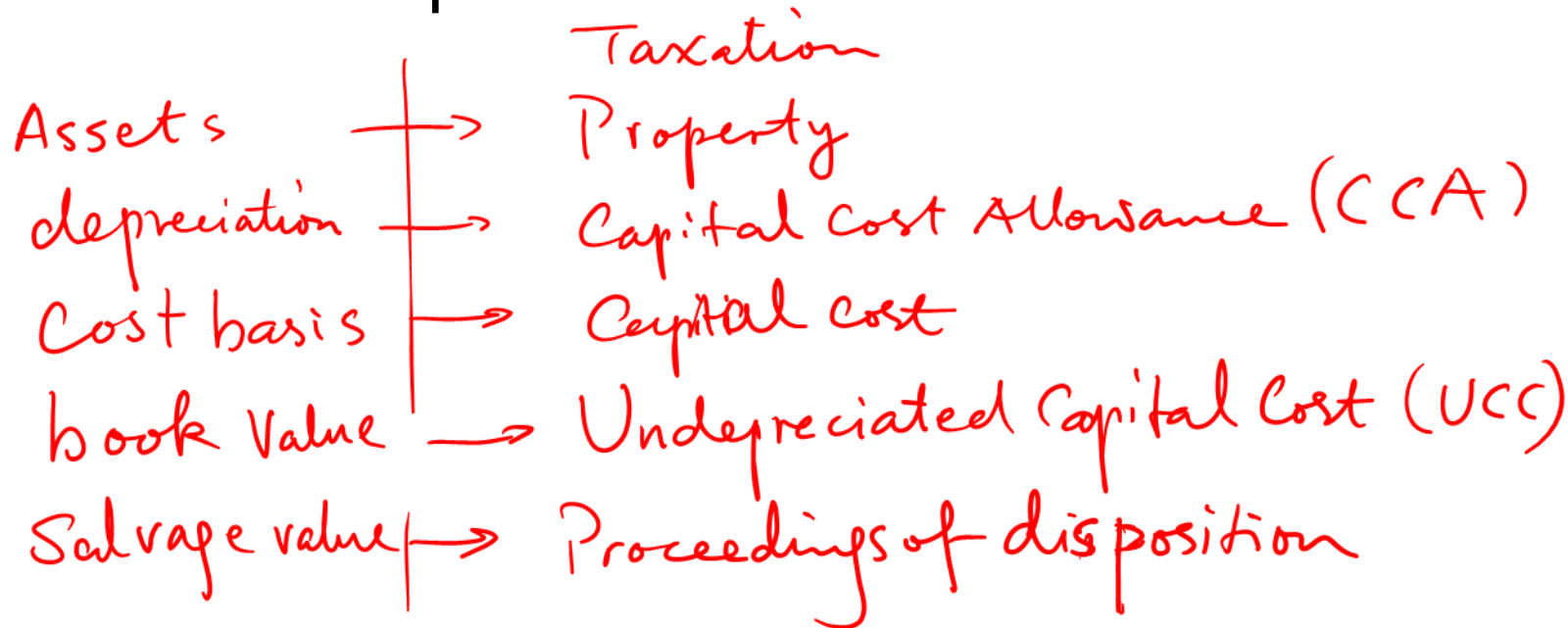
Contemporary Engineering Economics

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Lecture 24 Objectives

- Canada uses the capital cost allowance (CCA) system for tax depreciation. How does it work?



Capital Cost Allowance System

- The Canada Revenue Agency ^{CRA} specifies exactly how the CCA must be calculated.
- Most property items are not depreciated individually but are grouped into classes (also known as asset pools) as decreed by the tax regulations.
- ^{Default} ■ The declining balance ^{DB} method is used for most asset classes. To limit the maximum allowance, the tax rules specify a declining balance rate (CCA rate) for depreciation of each of these classes. }
- Guidelines are provided for determining the depreciable life for all property in the straight-line classes.

special classes: SL

Sample CCA Classes and Rates

Text book chapter 8 p. 444

CCA Class	CCA Rate	Description
1,3,6	4 – 10%	Buildings and additions
→ 8	20%	Office furniture and equipment
→ 9	25%	Aircraft, aircraft furniture
→ 10	30%	Passenger vehicles, vans
→ 16	40%	Taxis, rental cars
→ 12	100%	Dies, computer software

*tooling
e.g. mold, tools
fixtures*

Available-for-Use Rule

- The earliest taxation year in which CCA may be claimed for property is when it becomes available-for-use. This term has a specific meaning within the context of the Income Tax Act.
- Restrictions differ for building versus nonbuilding property.

p. 446 of
textbook

multiple
dates

①
②
③
④

2nd year after acquire
tax

①
②
③
④

Calculating the Capital Cost Allowance

- To claim a capital cost allowance, a corporation must fill out a Schedule 8 form according to the T2 Corporation Income Tax Guide.
- Each declining balance ^{DB} CCA class must be entered on a separate line of the form. Property belonging to one of the straight-line classes must have a separate calculation of CCA performed for each asset, which depends on many factors, including the nature of the asset and its duration.
- The total allowable ^{CCA (depreciation)} capital cost allowance for the firm is the sum of the CCAs across all classes.

Summary Version of Schedule 8: Capital Cost Allowance Form

multiple items are included

1st year of operation

50% of allowed CCA

1 Class number	2 Undepreciated capital cost at the beginning of the year	3 Cost of acquisitions during the year	4 Net Adjustments	5 Proceeds of dispositions in the year	6 Undepreciated capital cost (col. 2 plus col. 3 plus or minus col. 4 minus col. 5)	7 50% Rule (1/2 the amount, if any, by which net cost of acquisitions exceed col. 5)	8 Reduced undepreciated capital cost (col. 6 minus 7)	9 CCA Rate %	10 Recapture of capital cost allowance	11 Terminal loss	12 Capital cost allowance (col. 8 times col. 9)
1 st 2 nd 16	UCC (Book Value)	New purchase (P)	?	(S)	(P-S)	50%	Basis for	40%	CCA	to be detailed	CCA
	UCC ₂										

(P-S)

Calculating the Capital Cost Allowance

- **Column 1 Class number:** Each class of property is identified with the assigned class number.
- **Column 2 Undepreciated capital cost (UCC) at the beginning of the year:** This is the value of all the assets in the class at the start of the year. It is set equal to the UCC value of all the assets in the class at the end of the preceding taxation year.
- **Column 3 Cost of acquisitions during the year:** The total cost (including shipping, installation, and related fees) of depreciable property acquired by the business and available for use in the taxation year.

Calculating the Capital Cost Allowance (continued)

- **Column 4 Net adjustments:** Sometimes, amounts must be entered that either increase or decrease the capital cost of a property. ?
- **Column 5 Proceeds of dispositions during the year:** *Salvages* The net proceeds of disposition (after deducting costs of removal of the asset or restoring the site) are entered for each class. If these proceeds exceed the capital cost of the property, enter the capital cost.
- **Column 6 Undepreciated capital cost (UCC):** The value is calculated by adding columns 2 and 3, subtracting or adding the amount in column 4 depending on the type of adjustment, and subtracting the amount in column 5.

Calculating the Capital Cost Allowance (continued)

- **Column 7 50% rule:** Most new property that is available for use during the taxation year is only eligible for 50% of the normal maximum CCA for the year. The adjustment equals net cost of acquisitions minus the proceeds of dispositions.
- **Column 8 Reduced undepreciated capital cost:** A reduced UCC is required because of the 50% rule, by subtracting the amount in column 7 from column 6.
- **Column 9 CCA rate:** The prescribed CCA rate for the class is entered here.
- **Column 10 Recapture of capital cost allowance:** The recapture amount calculated in column 6 is entered here (if column 6 is negative).

$$CCA \leq 0$$

$$CCA = 0$$

Calculating the Capital Cost Allowance (continued)

- **Column 11 Terminal loss:** *disposal effect U, S* The terminal loss calculated in column 6 is entered here (if column 6 is + but there is no asset left in the class).
- **Column 12 Capital cost allowance:** *amount of CCA* The maximum allowable CCA for each class is calculated as the product of the reduced UCC from column 8 multiplied by the CCA rate in column 9.
- **Column 13 Undepreciated capital cost at the end of the year:** *next → UCC* This result is calculated by subtracting the amount in column 12 from the amount in column 6. For any class with a terminal loss or recapture of CCA, the UCC at the end of the year is always nil.

The 50% Rule

- The 50% rule, also known as the half-year convention, was introduced into the income tax system on November 12, 1981. For most classes, it limits the maximum capital cost allowance of new property acquired during the year to 50% of what it would otherwise be.

- **Let:**

- P = the capital cost of the property, $U_0 = P$
- U_n = the undepreciated capital cost at the end of year n ,
- \overline{CCA}_n = the maximum claimable capital cost allowance in year n ,
- d = the prescribed CCA rate

- Exceptions to the 50% rule

$$CCA_1 = d \cdot U_0$$

when 50% rule applied

$$CCA_1 = 50\% \cdot d \cdot U_0$$

CCA and UCC over time with and without the 50% rule

Without 50% Rule

DB
method

- CCA in year 1:

$$CCA_1 = \underline{Pd}$$

- CCA in years 2 to terminal time:

$$\underline{CCA_n = Pd(1-d)^{n-1}}$$

- UCC at the end of year n:

$$\underline{U_n = P(1-d)^n}$$

With 50% Rule

— only for 1st yr

- CCA in year 1:

$$CCA_1 = P(d/2)$$

- CCA in years 2 to terminal time:

$$\underline{CCA_n = Pd \left(1 - \frac{d}{2} \right) (1-d)^{n-2}}$$

- UCC at the end of year n:

$$\underline{U_n = P \left(1 - \frac{d}{2} \right) (1-d)^{n-1}}$$

Example for Asset Class CCA: Similar to Problem 8.34:

Otto-Rentals Ltd is setting up a new car rental corporation. In the first year they purchase 12 vehicles for a total of \$148,000. In year 2, they buy two more vehicles for \$27,000. In year 3, they sell 4 vehicles for \$29,000 and buy 5 new cars for \$71,000. In year 4, they sell 3 vehicles for \$16,000. These vehicles belong in CCA Class 16 (it has a CCA rate of 40%, see Table 8.1). What are the maximum CCA in each year and what are the UCC at the end of each year?

Example Solutions:

1 Class number	2 Undepreciated capital cost at the beginning of the year	3 Cost of acquisitions during the year (P)	5 Proceeds of dispositions in the year (S)	6 Undepreciated capital cost (col. 2 plus col. 3 plus or minus col. 4 minus col. 5) (BV)	7 50% Rule (1/2 the amount, if any, by which net cost of acquisitions exceed col. 5)	8 Reduced undepreciated capital cost (col. 6 minus 7)	9 CCA Rate %	12 Capital cost allowance (col. 8 times col. 9)	13 Undepreciated capital cost at the end of the year (col. 6 minus col. 12)
	A	B	C	D	E	F	G	H	I
16		148,000	0	148,000	74,000	74,000	40%	29,600	118,400
16	118,400	27,000	0	(A + B ₂) 145,400	13,500	(D ₂ - E ₂) 131,900	40%	52,760	92,640
16	92,640	71,000	29,000	134,640	21,000	113,640	40%	45,456	89,184
		(P - S)			50%				

$D_3 = A_3 + B_3 - C_3$

Exceptions to the 50% Rule

- Most Class 10 property must comply with the 50% rule, except for: television cable boxes or decoders; a Canadian film or video production.
- Most Class 12 property is exempt from the 50% rule except for: a die, jig, pattern, mould or last; the cutting or shaping part in a machine; the film or videotape comprising a television commercial message; a certified feature film or production; computer software (non-systems).
- All property in Classes 13, 14, 15, 23, 24, 27, 29 and 34 is exempt from the 50% rule (note: some provisions in classes 13, 24, 27, 29 and 34 require a reduction in their first-year CCA by 50%, but not using the same procedures as the 50% rule).
- Any property whose earliest available-for-use date is 358 days after acquisition (see section 8.4.2) is exempt from the 50% rule.

CCA for Individual Projects

- The following assumptions are used for calculating the CCA of new assets on a project basis:
 - Ignore any other activity in the class from outside the project. Implications of this include applying the 50% rule (if applicable) to a new asset in the project, and allowing the asset to fully depreciate every year of its useful life.
 - The disposal tax effect is based solely on the difference $U - S$ in the year of disposal, where U is the undepreciated capital cost and S the salvage value. That is, a gain relative to its UCC on disposal ($S > U$) gets taxed, while a relative loss from the sale ($S < U$) results in tax savings.
 - Property is disposed of at the end of the year. This allows the disposal tax effect to coincide with the salvage value transaction.

Example 8.11: CCA for Project

- Brigitte's Bakery is considering expanding to a second location in Corner Brook, Newfoundland. They would take out a lease on January 1, renewable every four years, in a vacant store at a cost of \$10,000 per year. They would install ^{Asset} \$13,000 worth of equipment for selling and storing the baked goods. If sales go as well as anticipated, after two years they will spend ^{CCA} \$6,000 on capital improvements to the store and install an oven for ^{Asset} \$3,000 so that they can produce some goods locally. To evaluate this proposal over an eight-year time horizon, Brigitte assumes that the salvage value of all equipment combined in eight years would be \$2,000. What CCA amounts need to be included in this project evaluation?

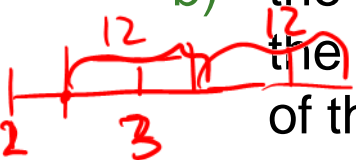
Example 8.11: Solution

- Brigitte's Bakery has a **leasehold interest** in the store property, so any capital improvements to the building are eligible for a CCA allowance under Class 13 (straight-line class). The capital cost allowance for this straight-line class is calculated as follows:
 - A prorated portion of the capital cost equals the lesser of:
 - a) one-fifth of the capital cost
 - b) the capital cost divided by the number of 12-month periods from the start of the year when the improvement was made to the end of the original lease plus first succeeding renewal (if applicable)
- Only half of the prorated portion may be claimed in the first year, with the balance claimable in the year following the end of the eight-year amortization period.

SL

$\$6000 / 6 \text{ yr} = \$1000/\text{yr}$
 Considering 1st yr, $\text{CCA}_1 = \$500$

$1/5$ rule; $\text{CCA}_1 < \frac{\$6000}{5} = \1200
 $\text{CCA}_n = \$1000$



Not applicable

50%

Example 8.11: Solution (continued)

- There are six years from the time of the capital improvements until the end of the lease's first renewal, so the prorated portion equals $\$6000/6 = \1000 (half in the first year).
- The equipment and oven fall into Class 8 (CCA rate = 20%)

End-of-Year	Equipment CCA	Oven CCA	Leasehold CCA	Total CCA
1	\$1300			\$1300
2	\$2340			\$2340
3	\$1872	\$300	\$500	\$2672
4	\$1498	\$540	\$1000	\$3038
5	\$1198	\$432	\$1000	\$2630
6	\$958	\$346	\$1000	\$2304
7	\$767	\$276	\$1000	\$2043
8	\$614	\$221	\$1000	\$1835

Handwritten notes:
 - DB, P=13,000 (for Equipment)
 - DB (for Oven)
 - SL Building P=6000 (for Leasehold)
 - * 50% (for Equipment and Oven)
 - 20% * (13,000 - 1,300) (for Equipment)
 - 20% (for Oven)
 - 20% (for Leasehold)
 - 6000 / 6 yrs (for Leasehold)
 - U₈ = 500 (for Leasehold)
 - for each year

Example 8.11: Solution (continued)

- By using the disposal tax effect simplification, where $U_8 = \$3,338$ and $S_8 = \$2,000$, then a terminal loss on the equipment of \$1,338 is assumed at the end of eight years. *UCC → Tax rebate will be granted*
- A similar adjustment may be made for the leasehold, which has a UCC of \$500 after eight years and an assumed salvage value of zero. *S = 0*
Loss

Additions or Alterations to Depreciable Assets

- When major alterations or repairs (overhaul) or additions (improvements) are made during the life of the asset, we need to determine whether these actions will extend the life of the asset or will increase the originally estimated salvage value.
- Under the capital cost allowance system, capital expenditures (additions or alterations) on existing depreciable property are treated as new depreciable property acquisitions.
- A part, added to a depreciable property, that requires regular replacement is not considered a capital expenditure. } *minor*

Example 8.12: Depreciation Adjustment for an Overhauled Asset

- In January 2000, Kendall Manufacturing Company purchased a new numerical control machine at a cost of \$60,000. The machine had an expected life of 10 years at the time of purchase and a zero expected salvage value at the end of the 10 years. For tax purposes, the machine was Class 43 property (CCA rate = 30%). In January 2003, however, the machine was thoroughly overhauled and rebuilt at a cost of \$15,000. It was estimated that the overhaul would extend the machine's useful life by five years. Calculate the CCA and UCC for the year 2005 for this machine.

Example 8.12: Solution

- **Given:** $P = \$60,000$, $S = \$0$, $N = 10$ years, machine overhaul = $\$15,000$, extended life = 15 years from the original purchase date.
- **Find:** U_6 and CCA_6 for tax depreciation.

Year	Original Machine		Overhaul	
	CCA ($d = 30\%$)	UCC (year-end)	CCA ($d = 30\%$)	UCC (year-end)
2000	\$9,000*	\$51,000		
2001	\$15,300	\$35,700		
2002	\$10,710	\$24,990		
2003	\$7,497	\$17,493		
2004	\$5,248	\$12,245		
2005	\$3,674	\$8,571	\$2,678	\$6,247

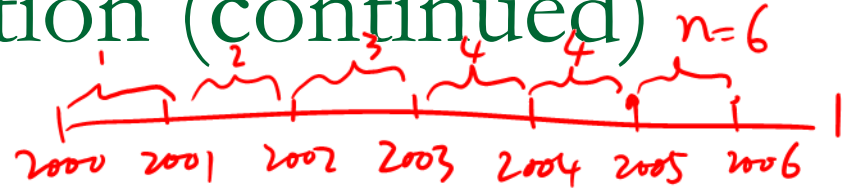
*The 50% rule applies to both assets in their respective first years.

Separate Item

UCC

$CCA_{2005} = A + B$
 $U_{2005} = C + B$

Example 8.12: Solution (continued)



- These results could also be obtained directly by using the CCA formulas as follows:

- For the original machine, $n = \boxed{6}$ years:
50% rule applied

$$\underline{CCA}_{2005} = \underline{Pd(1-d/2)(1-d)^{n-2}} = \$60,000(0.30)(1-0.15)(1-0.30)^4 = \underline{\$3674}$$

$$\underline{UCC}_{2005} = P(1-d/2)(1-d)^{n-1} = \$60,000(1-0.15)(1-0.30)^5 = \$8571$$

- For the overhaul, $n = \underline{3}$ years

$$CCA_{2005} = Pd(1-d/2)(1-d)^{n-2} = \$15,000(0.30)(1-0.15)(1-0.30)^1 = \$2678$$

$$UCC_{2005} = P(1-d/2)(1-d)^{n-1} = \$15,000(1-0.15)(1-0.30)^2 = \$6247$$

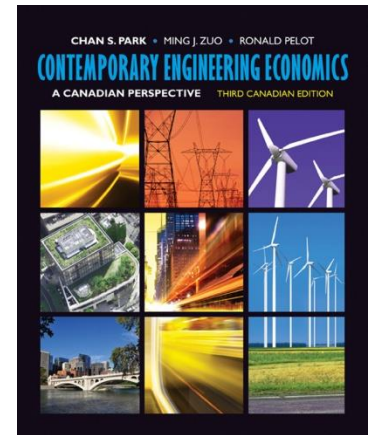
Problem 8.27:

	CCA	UCC
1	2,400*	120,000
2	4,704	117,600
3	4,516	112,896
4	4,335	108,380
		104,045 - UCC

On October 1, you purchased a residential home in which to locate your professional office for \$150,000. The appraisal is divided into \$30,000 for the land and \$120,000 for the building.
**never depreciate*
**No CCA*

- a) In your first year of ownership, how much CCA can you deduct? (Assume that the entire house is used for business.)
Attract CCA *Class 1, 4%*
- b) Suppose that the property was sold at \$187,000 at the end of the fourth year of ownership. What is the UCC, undepreciated capital cost of the building?
land \$30,000
\$157,000
Salvage for Building
** Gain will be taxed.*

Summary



Tax depreciation is the method of depreciation used for calculating taxable income and income taxes; it is governed by tax legislation. Two tax depreciation rules are prevalent: the **available-for-use rule** and the **50% rule**.