

# Sale of a Capital Asset – Tax Impact

- what happens at the end of the project when an asset is sold for above or below its book value?

## 1 below original cost and above book value

- the gain is considered a recapture of previously charged depreciation and is taxed as business income at the normal corporate rate

## 2 above original cost

- the difference between the selling price and original cost is treated as a capital gain and a portion of the gain is taxed at the normal corporate rate

<u>Year</u>	<u>Portion of gain taxed</u>
1971 and prior years	0
1971 to 1987	1/2
1988 and 1989	2/3
1990 to 1999	3/4
2000 and subsequent years	1/2

the rest of the gain is treated as business income as per 1) above

## 3 below book value

- the loss is treated as a terminal loss
- expense deduction received for the full amount of the loss if the asset is the last one in the CCA class

# Sale of a Capital Asset – Tax Impact

Example:

original cost      \$10,000  
 book value        \$ 2,000  
 (undepreciated capital cost)  
 tax rate            40%

Current capital gains treatment  (2003 capital gains rate)
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Selling Price	Tax Impact	
\$12,000	Income taxed at 40%	
	$10,000 - 2,000 = 8,000$	→ 3,200
	Capital gain taxed at 40%	
	$1/2 * (12,000 - 10,000) = 1,000$	→ <u>400</u>
	TAX PAYABLE	<u>3,600</u>
\$ 7,000	Income taxed at 40%	
	$7,000 - 2,000 = 5,000$	→ <u>2,000</u>
	TAX PAYABLE	<u>2,000</u>
\$ 2,000	NO TAX IMPACT	
\$ 1,000	Terminal loss	
	$2,000 - 1,000 = 1,000$	→ <u>1,000</u>
	Expense deduction from income*	<u>1,000</u>
	TAX REDUCTION*	<u>400</u>

\* if no assets remain in that particular class

# Income Tax Incentives

## Accelerated Capital Cost Allowances

- accelerated depreciation is often used by the government as an incentive to encourage investment in selected assets or industries

## Investment Tax Credits

- to stimulate new business capital spending in Canada, expenditures in certain new buildings, equipment or scientific R&D receive a tax credit
- credit depends on the region where the expenditure is incurred (3% - 45%)
- designed to encourage industrial development in those parts of Canada most adversely affected by economic disparities
  - Industrial Research Assistance Program
  - Industry and Labour Adjustment Program
  - New Technology Employment Program
  - Program for Export Market Development
- tax incentives affect the after-tax cash flows
- projects that had an unacceptably low return may be worthwhile if a tax incentive program is applicable
- the ranking of projects may be significantly different when available tax incentives are considered
- tax credits may be carried forward if no taxes are payable in the current year

## **Income Tax Incentives – Example**

### **Tax Credit Calculation**

A firm invests \$500 000 and \$1 200 000 in qualifying assets having lives of 4 and 12 years, respectively. Both qualify for a 7% investment tax credit. Tax liability is \$200 000. What is the tax credit, as well as the tax credit used?

$$\text{Tax credit} = (500\,000 + 1\,200\,000) \times 0.07 = \$119\,000$$

Under the terms of this particular tax incentive program, the tax credit may be used to offset all tax liability up to the first \$15 000 and 50% of that in excess of \$15 000.

$$\begin{aligned}\text{Tax credit used} &= 15\,000 + (200\,000 - 15\,000) \times 0.50 \\ &= \$107\,500\end{aligned}$$

$$\begin{aligned}\text{Unused tax credit} &= 119\,000 - 107\,500 \\ &= \$11\,500\end{aligned}$$

The unused tax credit can be carried forward to reduce taxes in future years.

# **Supercomputer Project**

## **Cape Breton Island, Nova Scotia**

A company is considering acquiring a brand new super-computer for scientific research. It is using a four-year planning horizon. It has done an analysis of all the benefits and costs of the project with the exception of the tax benefits of depreciation and possible tax credit programs. Because of the risk of the project, a 30% discount rate for project evaluation is being used.

The NPV of all the benefits and costs (excluding the present value of the tax credits due to depreciation and other government programs) of locating the supercomputer in a major central Canadian city is -\$7,400,000.

The company has also done an analysis on locating the super-computer on Cape Breton Island because of the Enterprise Cape Breton Investment Tax Credit Program. Because of the additional costs of locating on CBI, the NPV of this project is -\$7,800,000. The tax credit allowed is 20% of the investment and it can be used in the year of the investment. The amount of the tax credit must be deducted from the purchase price of the asset to establish the initial book value for CCA purposes. The super-computer is expected to have zero salvage value at the end of year four and the book value at that time can be considered to be a terminal loss.

The supercomputer costs \$33 million and is CCA Class 10. The tax rate is 40% and the company has sufficient income from other sources to use the full amount of the tax credit and savings in the year that they occur.

# Supercomputer Project

CCA Class 10 (p=30%)

Tax Rate = 40%

## 1 No Tax Credit (\$Millions)

Year t	Book Value	CCA	Tax Reduction	P F(30,t)	PV (Tax Savings)
0	33.0			1.0000	
1	28.0	5.0	2.0	0.7692	1.5
2	19.6	8.4	3.4	0.5917	2.0
3	13.7	5.9	2.4	0.4552	1.1
4	9.6	4.1	1.6	0.3501	0.6
No salvage value - terminal loss in Year 4					
4	9.6	9.6	3.8	0.3501	<u>1.3</u>
PV (Tax Savings)					<u>6.5</u>

## 2 20% Investment Tax Credit (\$Millions)

$$20\% \times 33.0 = 6.6$$

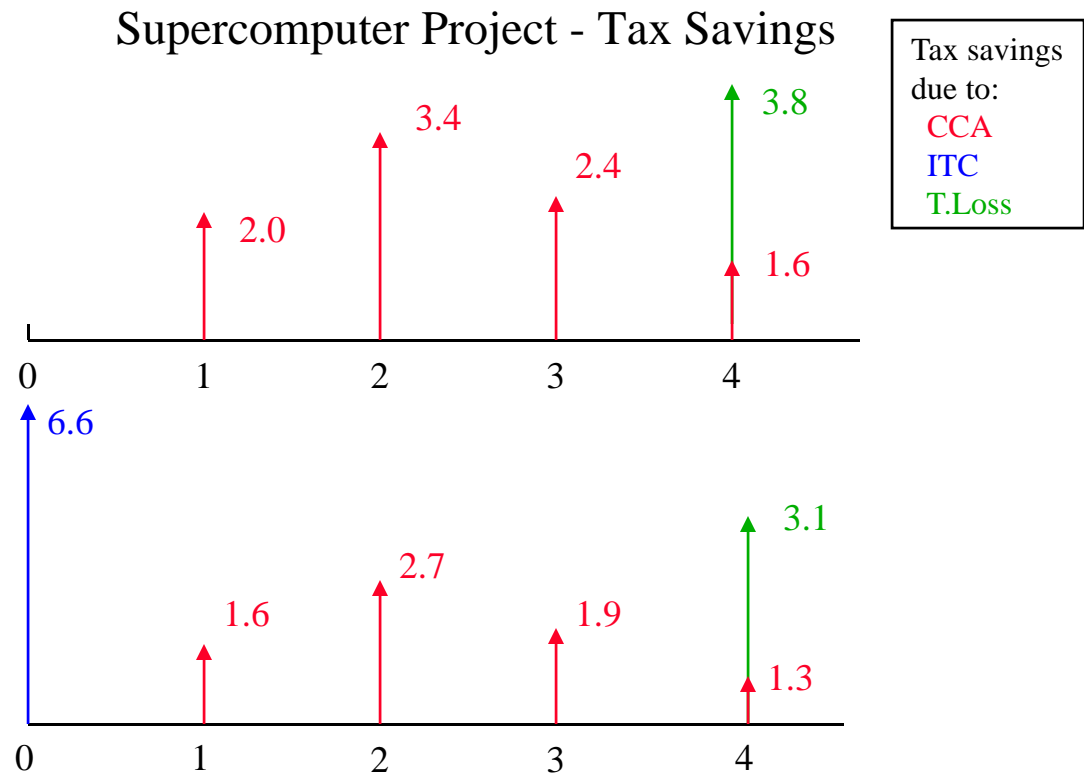
Immediate tax reduction of 6.6

Reduce book value of asset by 6.6 million because of the credit

Year t	Book Value	CCA	Tax Reduction	P F(30,t)	PV (Tax Savings)
0	26.4			1.0000	
1	22.4	4.0	1.6	0.7692	1.2
2	15.7	6.7	2.7	0.5917	1.6
3	11.0	4.7	1.9	0.4552	0.9
4	7.7	3.3	1.3	0.3501	0.5
Terminal loss in Year 4					
4	7.7	7.7	3.1	0.3501	<u>1.1</u>

$$PV (\text{Tax Savings}) = \underline{5.2+6.6=11.8}$$

# Supercomputer Project - Tax Savings



## Investment Tax Credit

PV (Tax Savings)

\$ millions

1) no ITC

6.5

2) with ITC

11.8

<u>Alternatives</u>	<u>NPV</u>	<u>NPV(TS)</u>	<u>TOTAL NPV</u>
1) Central Canada (no ITC)	-7.4	6.5	-0.9
2) CBI (no ITC)	-7.8	6.5	-1.3
3) CBI (with ITC)	-7.8	11.8	4.0

Enterprise Cape Breton has generated \$4.0 million of value!

# Supercomputer Project

The Toronto Star

## Cape Breton firm defaults on supercomputer payment

By Alan Story Toronto Star

HALIFAX — A supercomputer established on Cape Breton Island to collect almost \$20 million in tax credits and cash has yet to win a single computer contract after five months of operation, a company spokesman has admitted.

Ottawa-based Magnus Aerospace Manufacturing Ltd. set up the supercomputer, invoiced at \$33.4 million, in late November. It was to conduct aeronautical research on a blimp it hopes to sell to the U.S. Star Wars program and to win commercial contracts.

But no deals have been struck. And the vendor of the supercomputer is now in a legal position to unplug and seize the equipment after Magnus defaulted on its first \$3 million payment for the computer three weeks ago.

The tax credit deal and computer sale is under investigation by Revenue Canada and the commercial crime squad of the Royal

Canadian Mounted Police in Nova Scotia.

Despite these developments, Bernard Shinder of Ottawa, corporate counsel and spokesman for Magnus, said Magnus is "on the threshold of getting our tax money."

The small company will receive a government cheque for \$8.3 million very shortly, he said, and the balance of the \$19.8 million in tax credits when Magnus begins making a profit.

"We have investors with deep pockets and lots of patience" said Shinder, adding that Magnus was in the process of raising another \$35 million to \$40 million from other investors for their Sydney, N.S., operation.

The cash and tax credits were approved in January by Enterprise Cape Breton, a development agency of the Department of Regional Industrial Expansion, which administers the lucrative Cape Breton investment tax credit scheme and which has been very "encouraging" to Magnus, Shinder said.

The commercial viability of a project is not considered when tax credits are awarded.

In recent months, supercomputer experts interviewed by The Star have said that parts of the CYBER 205 supercomputer installed in Cape Breton were previously used in the Minneapolis headquarters of the computer's vendor, Control Data Corp., and its Canadian subsidiary, Control Data Canada of Mississauga.

Only new and unused equipment is eligible for tax credits under the Cape Breton tax credit plan established by the federal government in May, 1985, as a job-creation program.

Control Data Canada officials refuse to say whether the equipment is new or used, only that it is "warranted as new."

Other supercomputer experts say the Canadian fair market value of the older-generation Control Data supercomputer is between \$5 million and \$17 million, instead of its invoiced price of \$33 million.

The University of Toronto recently purchased a Cray X-MP/24 supercomputer, considered faster than Control Data's CYBER 205, from Cray Research of Minneapolis for \$12.9 million.

- tax credits are of little value if the company is not making any money and hence not paying taxes



# Supercomputer Project

The Toronto Star

## Cape Breton ventures big drain on taxpayers

By John Spears  
TORONTO STAR

HALIFAX — Big business, backed by big money from federal taxpayers, has been a big bust on depressed Cape Breton Island, says a new federal report.

The report on Enterprise Cape Breton, which has been trying to build up the island's economy for the past five years, was released yesterday by Elmer MacKay, the minister in charge of the agency.

The report says Enterprise Cape Breton, or ECB, offered businesses some of Canada's richest handouts. But the agency poured much of its money into big, glamorous projects that have failed to deliver the jobs they promised.

Newfoundland businessman Anthony Brait, who wrote the report, said that ECB has handed out nearly \$110 million to Cape Breton businesses since it was created in 1985. But the spending has done little to lower the island's unemployment rate.

While small businesses, worth less than \$1 million, were most successful at creating new jobs, ECB poured 88 per cent of its money into larger businesses

worth more than \$1 million.

Brait also noted that in a related program, Ottawa gave businesses and individuals \$148 million in special tax credits for investment related to Cape Breton — but it's impossible to say whether the program really created new businesses.

ECB's most spectacular failures have been well known over the past few years.

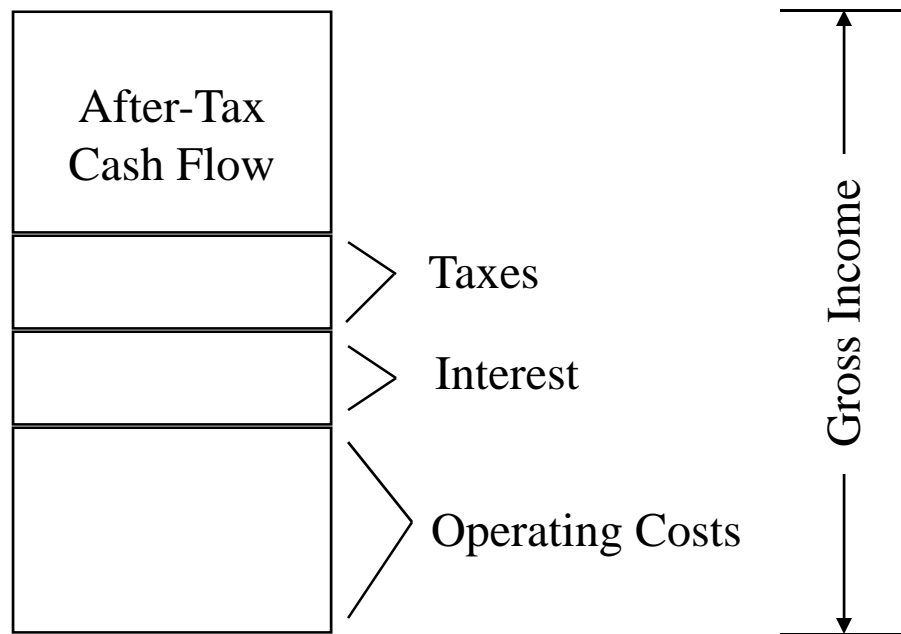
Among them:

- ☐ Technitread, a tire retreading outfit, got \$2.2 million from ECB but never started operating. RCMP are investigating the firm.
- ☐ A fish oil company got \$1 million in grants and defaulted on \$3.5 million in ECB financing.
- ☐ A cellular phone maker got \$2 million from ECB but folded before it ever began operations.

Of the \$109 million that ECB has already paid out, \$22 million has gone to firms that have already folded.

And ECB has authorized payment of another \$50 million to ventures that are classified as "high risk." That means their future is "questionable," according to Brait.

## Capital Budgeting - After-Tax Treatment



- evaluate projects on the basis of after-tax cash flows
- only after-tax income adds value to the firm
- although depreciation is not a cash flow, its effects must be considered because of the tax implications
- the stream of future depreciation tax savings reduces the firm's cash outflow because it reduces the income tax payable

## Determining After-Tax Cash Flows

- What are the effects of the benefits and costs of a project on the after-tax cash flows?
- consider the income statement

### Income Statement

Sales		\$10,000
Operating Cost	\$7,000	
Depreciation	500	
Interest charges	<u>500</u>	
		<u>8,000</u>
Income before taxes		2,000
Taxes (40%)		<u>800</u>
Income after taxes		<u>1,200</u>

- the income statement combines operating, financial and non cash flow costs to determine income according to generally accepted accounting principles
- capital cash flows missing on the income statement
- how does each benefit and cost contribute to the after-tax cash flow?
- convert the income statement to a net operating cash flow statement

# Net Operating Cash Flow Statement

## Sales

- benefit - cash flow
- $\text{price} \times \text{quantity}$

## Operating Costs

- cost - cash flow expense

## Taxes

- cost - cash flow

## Interest

- cost - cash flow
- interest is not an operating expense but a financial one
- use the after-tax weighted average cost of capital for project evaluation
- don't tie the project to the method of financing used
- all financial costs are reflected in the cost of capital
- interest cash flows are not relevant in operating cash flow analysis

# Net Operating Cash Flow Statement

## Depreciation

- cost - allocation of first cost - not a cash flow expense
- how does it affect cash flows?

### Income Statement

	<u>with depreciation</u>	<u>without depreciation</u>
Sales	10,000	10,000
OC     7,000		7,000
Depr.     500		-
Interest <u>500</u>	<u>8,000</u>	<u>500</u> <u>7,500</u>
I before T	2,000	2,500
Taxes	<u>800</u>	<u>1,000</u>
I after T	<u>1,200</u>	<u>1,500</u>

- the presence of depreciation has reduced taxes by \$200
- depreciation tax benefit
  - = tax rate  $\times$  depreciation
  - =  $0.40 \times$  depreciation
- include the depreciation tax benefit in the after-tax cash flows

# Net Operating Cash Flow Statement

After-tax cash flow

= after-tax operating cash income + depreciation tax benefit

Sales (Price $\times$ Quantity)	10,000
Operating cash cost (OCC)	<u>7,000</u>
Net operating income (NOI)	3,000
Taxes (t=40%)	<u>1,200</u>
After-tax NOI: NOI (1-t)	1,800
Depreciation tax benefit (t $\times$ Depreciation)	<u>200</u>
Net cash flow (NCF)	<u>2,000</u>

After-Tax Net Cash Flow

$$\begin{aligned}
 \text{NCF} &= \text{NOI}(1-t) + t \times \text{Depreciation} \\
 &= (\text{Sales} - \text{OCC})(1-t) + t \times \text{Depreciation} \\
 &= 0.6(\text{Sales} - \text{OCC}) + 0.4 \times \text{Depreciation} \\
 \therefore \text{NCF} &= (10,000 - 7,000)(1 - 0.4) + 0.4(500) \\
 &= 2,000
 \end{aligned}$$

# Project Evaluation

Determine the after-tax cash flows

Discount these cash flows using the after-tax cost of capital

Use a comparative operating cash flow statement

	A	B	B-A
	(Depr = 500)	(Depr = 1,000)	
Sales	10,000	15,000	5,000
Operating costs	<u>7,000</u>	<u>10,000</u>	<u>3,000</u>
NOI	3,000	5,000	2,000
Taxes (40%)	<u>1,200</u>	<u>2,000</u>	<u>800</u>
After-tax NOI	1,800	3,000	1,200
Depr Tax Benefit	<u>200</u>	<u>400</u>	<u>200</u>
NCF	<u>2,000</u>	<u>3,400</u>	<u>1,400</u>

## **After-Tax Net Cash Flow**

$$\Delta \text{NCF} = \Delta \text{NOI}(1-t) + t \times \Delta \text{Depreciation}$$

$$= (\Delta \text{Sales} - \Delta \text{OCC})(1-t) + t \times \Delta \text{Depreciation}$$

$$= 0.6(\Delta \text{Sales} - \Delta \text{OCC}) + 0.4(\Delta \text{Depreciation})$$

$$\therefore \Delta \text{NCF} = 0.6(5,000 - 3,000) + 0.4(500)$$

$$= 1,400$$



# Capital Budgeting Project Evaluation

- Consider all tax effects (tax rate = 40%)

## Example

### Replacement Analysis

- change in revenues
- change in operating costs
- change in depreciation

#### 1 Acquisition

- cash outlay for new machine
- tax consequences of disposing of old machine
- proceeds from sale of old machine

#### 2 Annual Benefits

- after-tax effect of change in revenues, operating costs and depreciation on cash flows need to be determined

#### 3 Salvage Value

- tax consequences of machine disposal at end of project
- proceeds from the sale of the machine

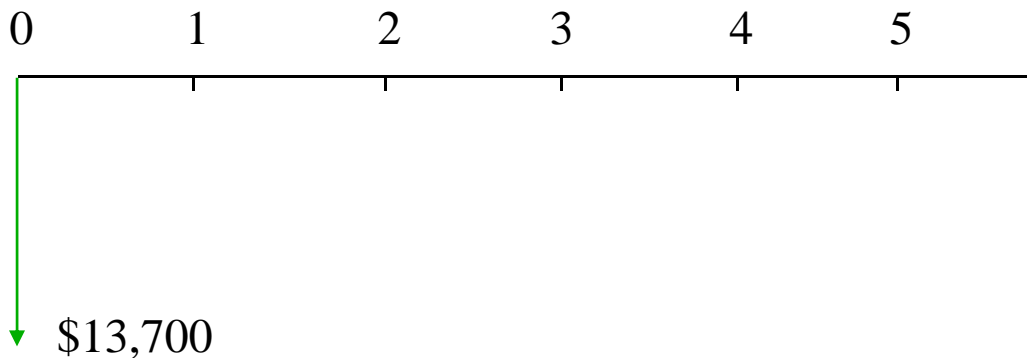
#### 4 Calculate Net Present Value

- use after-tax cost of capital

# 1. Acquisition Costs

## Estimate Cash Outlay

1	Payment to the vendor for new machine	
	New machine costs \$20,000	\$20,000
2	Proceeds from sale of old machine	
	Salvage value \$6,500	\$ 6,500
3	Tax effects of sale of old machine	
	Book value of old machine	\$6,000
	Salvage value	<u>6,500</u>
	Depreciation recapture	500
	(tax laws permitted depreciation at a rate greater than the loss of value)	
	Increase in taxes $0.4 \times \$500$	<u>\$ 200</u>
	NET CASH OUTLAY	<u>\$13,700</u>



## 2. Annual Benefits (Net Operating Income Approach)

Determine the effect of the new machine on the after-tax cash flows

Use an incremental analysis: NEW - OLD

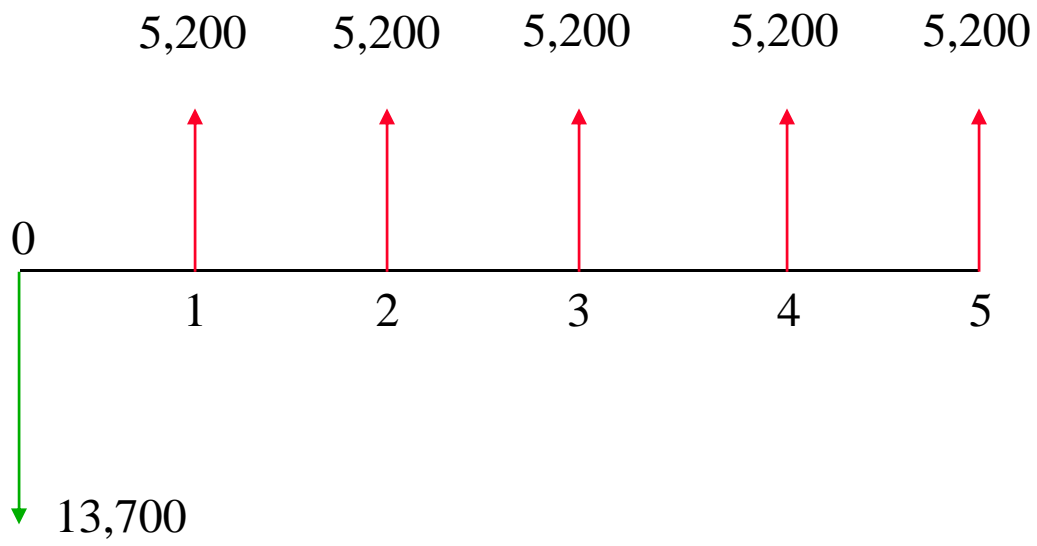
Depreciation: OLD - 1000/Year; NEW - 2000/Year

	Without New <u>Investment</u>	With New <u>Investment</u>	Difference
Revenue	10,000	16,000	6,000
Operating costs	<u>8,000</u>	<u>6,000</u>	<u>(2,000)</u>
NOI	2,000	10,000	8,000
Taxes (40%)	<u>800</u>	<u>4,000</u>	<u>3,200</u>
After tax			
NOI	1,200	6,000	4,800
Depr. tax benefit	<u>400</u>	<u>800</u>	<u>400</u>
NCF	<u>1,600</u>	<u>6,800</u>	<u>5,200</u>

$$\Delta \text{NCF} = \$5,200/\text{year}$$

# Project Cash Flows

(NEW – OLD)



## 2. Annual Benefits (Income Statement Approach)

NEW - OLD

Depreciation: OLD - 1000/yr, NEW - 2000/yr

	OLD	NEW	NEW-OLD	
Revenue	10,000	16,000	6,000	* →
Operating costs	8,000	6,000	(2,000)	* →
Depreciation	<u>1,000</u>	<u>2,000</u>	<u>1,000</u>	
Taxable Income	1,000	8,000	7,000	
Taxes (40%)	<u>400</u>	<u>3,200</u>	<u>2,800</u>	* →
After-tax Income	<u>600</u>	<u>4,800</u>	<u>4,200</u>	
Cash Flows:	6,000			←
- -	2,000			
-	<u>2,800</u>			
Δ Net Cash Flow	<u>5,200</u>			

### 3. Salvage Value

- 1 Proceeds from the sale of the equipment in Year 5.

Estimated salvage value

New machine	\$10,000
Old machine	<u>0</u>
Incremental proceeds	<u>\$10,000</u>

- 2 Tax effects of disposal

Depreciation: OLD - \$1,000/Year; NEW - \$2,000/year

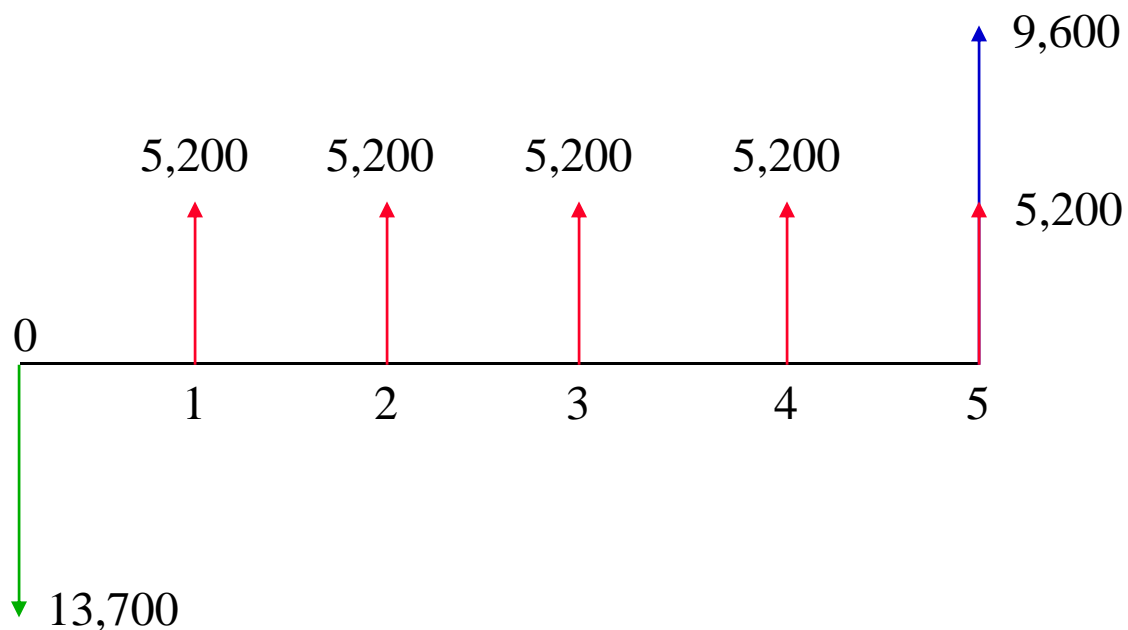
<u>EOY</u>	<u>BOOK VALUE</u>	
	<u>OLD</u>	<u>NEW</u>
0	6,000	20,000
1	5,000	18,000
2	4,000	16,000
3	3,000	14,000
4	2,000	12,000
5	1,000	10,000

# Salvage Value

New Machine: salvage value = book value (no tax effect)

Old Machine: terminal loss of \$1,000

- would have reduced taxes payable in Year 5  
by \$400 if the “keep old machine”  
alternative had been chosen



- the \$10,000 salvage value cash flow has  
been reduced by \$400

## 4. Calculate Net Present Value

Calculate NPV using after-tax cost of capital (MARR)

		Present Value Factor	
<u>Year</u>	<u>NCF</u>	<u>(k=10%)</u>	<u>PV(NCF)</u>
0	-13,700	1.0000	-13,700
1	5,200	0.9091	4,727
2	5,200	0.8264	4,298
3	5,200	0.7513	3,907
4	5,200	0.6830	3,552
5	5,200	0.6209	3,229
5	9,600	0.6209	<u>5,961</u>
PV(NCF)			<u>11,973</u>

$PV(NCF) > 0$  Therefore, replace the machine.

$$NPV = -13,700 + 5,200(P|A\ 10,5) + 9,600(P|F\ 10,5)$$



# Effect of Interest on After-Tax Project Evaluation

## Cost of Equity

18%

- gain to shareholders through dividends & share price increases
- equity investment higher risk than debt/bonds

## Cost of Debt

10%

- 10 year bond
- face value repaid in year 10
- annual interest payments to bond holders at 10% of face value

- Company uses a 50%/50% debt-equity mix

### **cost of capital before taxes:**

$$k_{BT} = (0.5)18\% + (0.5)10\% = 14\%$$

- Interest is a tax-deductible expense

### **cost of capital after taxes:**

$$k \approx (0.5)18\% + (1-t)(0.5)10\% \quad t=40\%$$

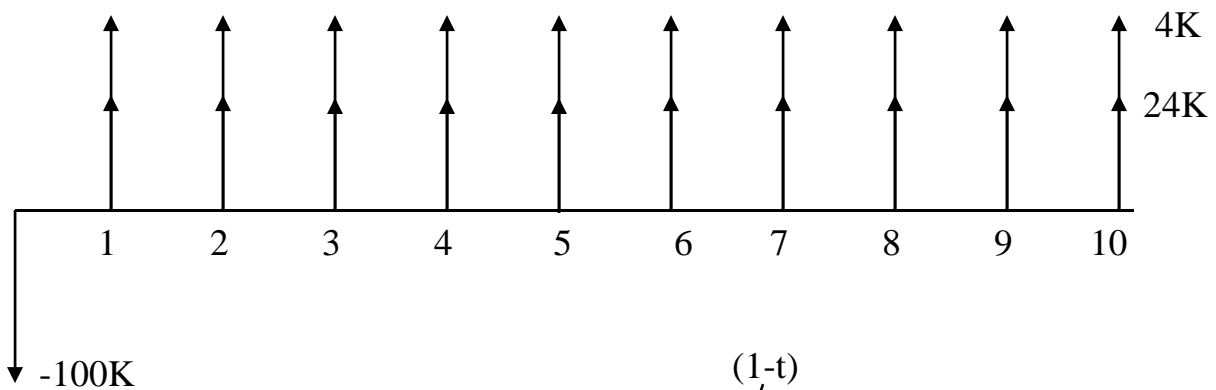
$$\approx 12\% \quad (\text{approximation} - 12.8\% \text{ is actual rate})$$

- \$1,000 interest expense has an after-tax cost of  $[(1-t)1000]$  which equals \$600

## High-Volume Photocopier

-initial cost	\$100,000	-planning period - 10 years
-annual savings	40,000	-assume straight-line
-salvage value	0	depreciation

METHOD 1: Use the after-tax cost of capital as the MARR  
( $k=12.8\%$ )



After-tax annual savings  $\$40,000 \times 0.6 = 24,000$

S/L depreciation  $\frac{100,000 - 0}{10} = 10,000$

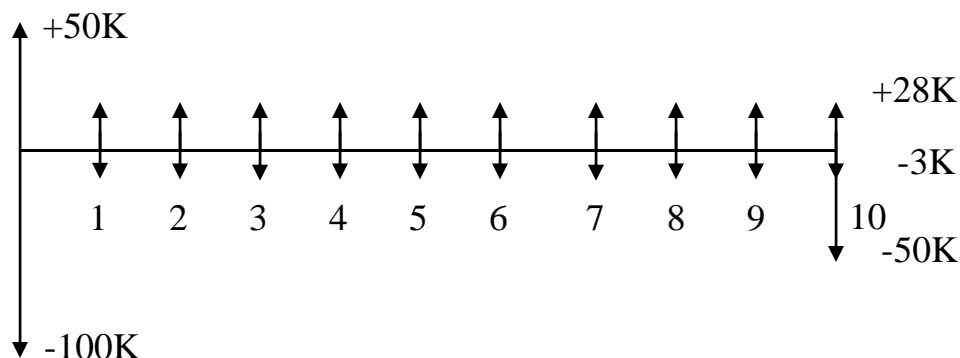
Tax savings  $10,000 \times 0.4 = 4,000$   
 $\uparrow \quad \uparrow$   
 Depr  $\times$  t

$PV(12.8\%) = -100,000 + 28,000 (P|A\ 12.8, 10)$   
 $= \$53K$

NB: Financial charges are implicitly included in the cost of capital and are not included in the cash-flow analysis

# High-Volume Photocopier

METHOD 2: Include the loan (bond) in the analysis



- 50%/50% debt/equity  $\Rightarrow$  \$50,000 bond issue

annual interest  $50,000 \times 10\% = \$5,000$   
 after-tax interest cost  $5,000 (0.6) = \$3,000$   
 repayment of face value in Year 10  $\$50,000$

- annual after-tax savings  $\$24,000$
- depreciation tax savings  $\$ 4,000$
- After-tax interest cost  $\underline{(\$ 3,000)}$   
 $\$25,000$

# High-Volume Photocopier Equity Funding

What Rate Should be Used for the MARR?

Since \$50,000 of equity funds are being used the cost of equity is the MARR

$$\begin{aligned} PV(18\%) &= -50,000 + 25,000(P|A \ 18,10) - 50,000(P|F \ 18,10) \\ &= \$53K \end{aligned}$$

- Method 1 is most frequently used in industry

# The Lease Versus Buy Decision

## Operational Lease

- not a direct alternative to ownership
- contract to acquire the temporary use of something
- short-term commitment which generally includes a cancellation clause
- owner attempts to recover investment through a whole series of leases, not just one
- operating leases are treated as expense items

## The Financial Lease

- direct alternative to ownership
- the lessee is committed to a regular series of fixed payments over a specific time period
- time period frequently the anticipated useful life of the asset
- owner attempts to recover investment during the initial lease
- often a provision to renew at a much lower lease rate

# Lease Versus Buy Comparison

What framework should be used to evaluate the lease versus buy decision?

## Buy Option

- asset is financed by raising debt and equity in the optimal proportions
- the debt-equity ratio used is the one that minimizes the cost of capital to the firm
- optimal capital structure is maintained
- since the firm owns the asset, it can claim CCA

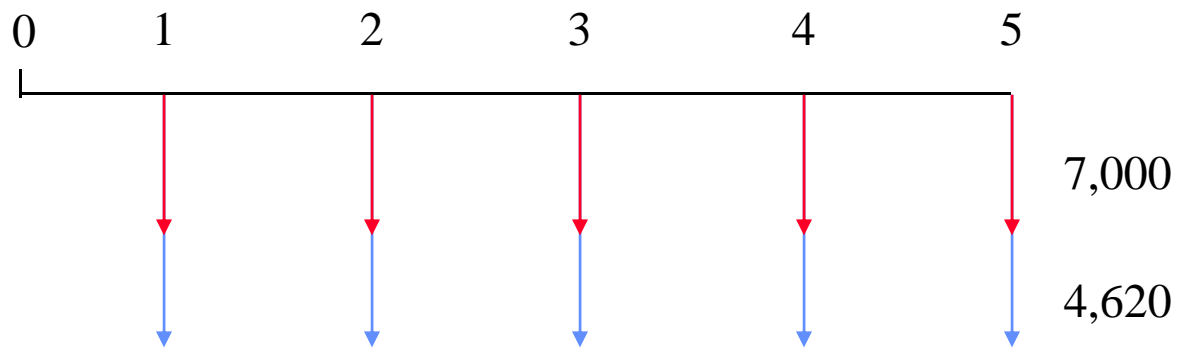
## Lease Option

- firm does not acquire ownership of the asset
- firm is committed to make the payments just as if it were a debt obligation
- leases are a form of leverage - fixed costs generating variable revenues
- in the eyes of the shareholders, leases are a form of debt
- assuming lease obligations effectively increases the debt-equity ratio
- leases are a “hidden” form of debt
- 100% financing
- footnote in the financial statements

# Lease Versus Buy Comparison

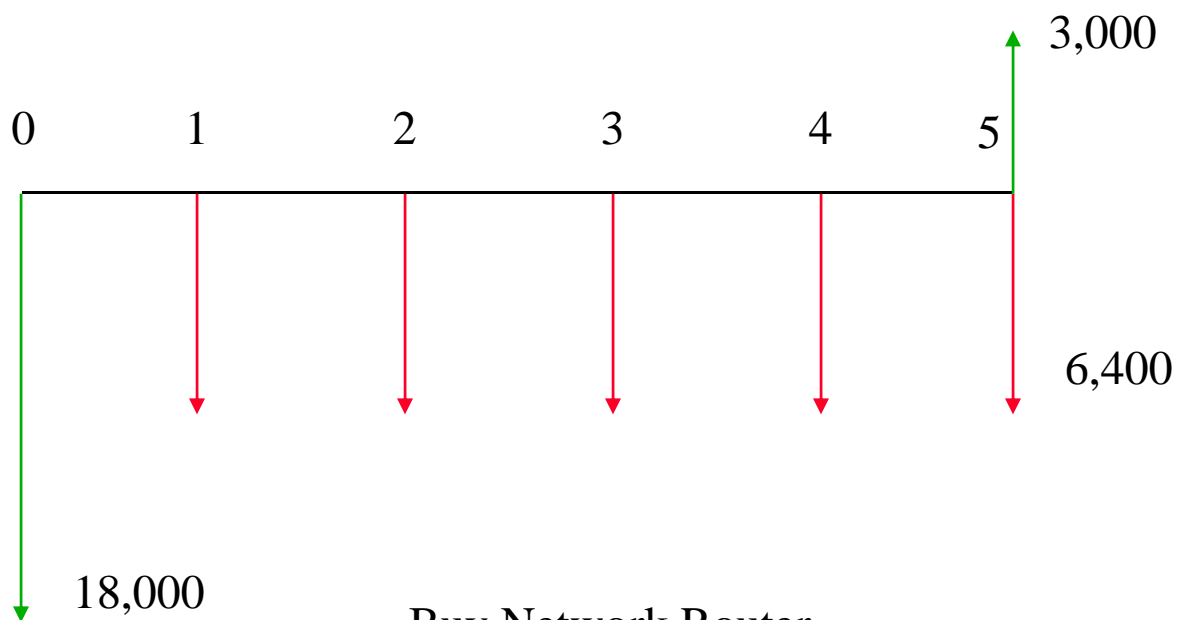
## Lease Network Router

Lease Payment	\$4,620
Term	5 years
Annual Maintenance	\$7,000



Before-Tax Cash Flows

## Before-Tax Cash Flows



### Buy Network Router

First Cost	\$18,000
Economic Life	5 years
Annual Maintenance	\$ 6,400
Salvage	\$ 3,000
CCA Depreciation Class	10



# Lease Option

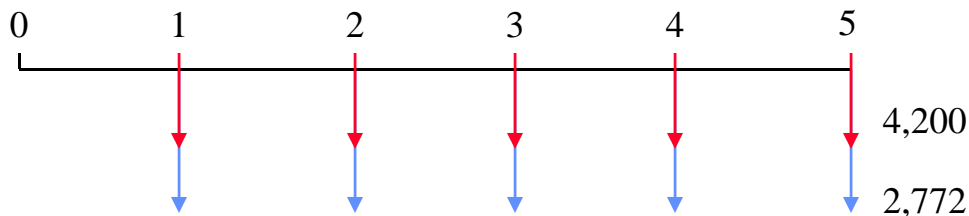
Cost of lease option = lease payment + maintenance

The leasing company owns the network router

<u>Income Statement</u>			<u>Cash Flows</u>
Lease Payment (LP)	4,620	*→	-4,620
Maintenance (Mtce)	<u>7,000</u>	*→	-7,000
Income (Before tax)	-11,620		
Tax	<u>-4,648</u>	*→	- (-4,648)
Net Income	<u>-6,972</u>		<u>-6,972</u>

## After-Tax Cash Flows

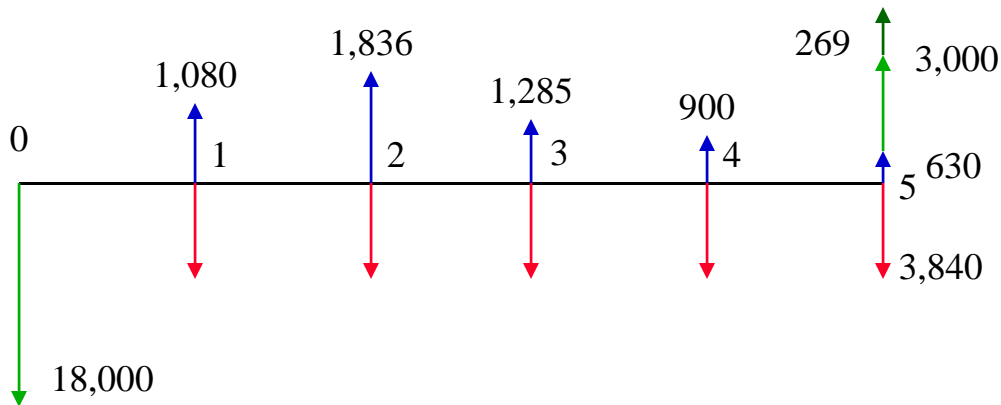
<u>EOY</u>	<u>LP</u>	<u>Mtce</u>	<u>NCF</u>
0			0
1	-2,772	-4,200	-6,972
2	-2,772	-4,200	-6,972
3	-2,772	-4,200	-6,972
4	-2,772	-4,200	-6,972
5	-2,772	-4,200	-6,972



	Before Tax	After Tax
Lease payment	= \$4,620	\$2,772
Maintenance	= \$7,000	\$4,200

## Buy Option

- Since the firm owns the network router, it can claim CCA
- Therefore the CCA tax benefits accrue to the firm



- CCA Class 10 - 30%

EOY	Capital	Mtce	CCA Pool	Depr	Tax Benefit	NCF
0	-18,000					-18,000
1		-3,840	9,000	2,700	1,080	-2,760
2		-3,840	15,300	4,590	1,836	-2,004
3		-3,840	10,710	3,213	1,285	-2,555
4		-3,840	7,497	2,249	900	-2,940
5		-3,840	5,248	1,574	630	-3,210
5*			3,674	674	269	269
5**	3,000					3,000

\*Terminal loss in year - CCA did not depreciate asset quickly enough  
 - assume this router the last asset in its class

\*\*Salvage value

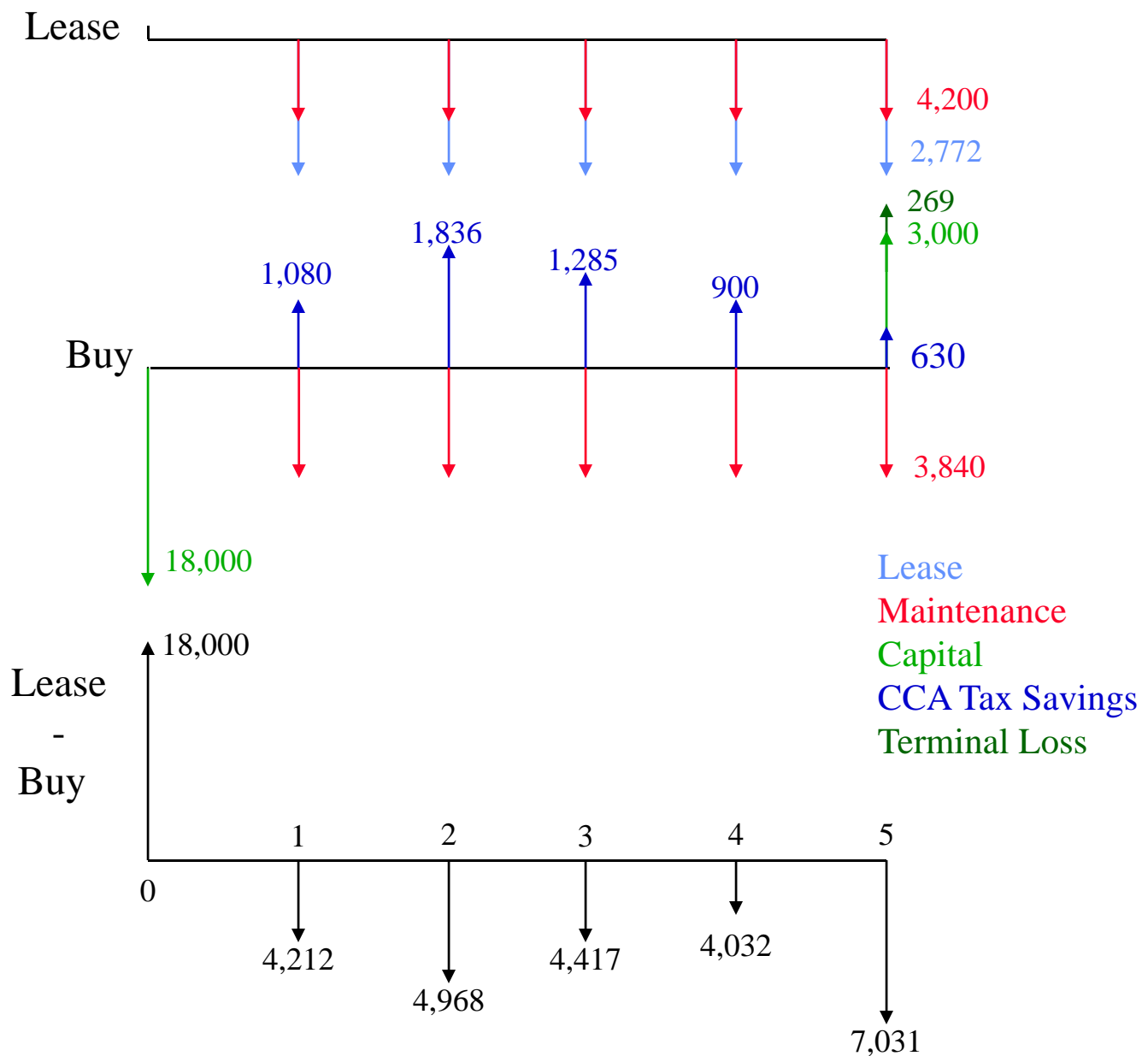
$$\text{Depreciation Tax Benefit} = t * \text{Depreciation}$$

$$\text{After-Tax Cost (Expense)} = (1-t) \text{ Cost}$$

$$\text{Maintenance: } 3,840 = (1-0.4) 6,400$$

# Incremental Analysis: Lease - Buy

- Consider the difference in cash flows between the two alternatives



## Incremental Analysis: Lease - Buy

- Consider the difference in cash flows between options
- Is the benefit of not having to invest the firm's funds in the network router worth the annual cost of the lease?

EOY t	Lease NCF	Buy NCF	(L-B) NCF	P F(8%,t)	PV (NCF)
0	0	-18,000	18,000	1.0000	18,000
1	-6,972	-2,760	-4,212	0.9259	-3,900
2	-6,972	-2,004	-4,968	0.8573	-4,259
3	-6,972	-2,555	-4,417	0.7938	-3,507
4	-6,972	-2,940	-4,032	0.7350	-2,963
5	-6,972	59	-7,031	0.6806	<u>-4,785</u>
PV(NCF)					<u>-1,414</u>

Therefore, the network router should be purchased.

## Summary: CCA & Depreciation

- Depreciation is NOT a cash flow
- It is an allocation of cost
- A company does not write a cheque to pay someone for the year's depreciation expense
- Depreciation is a non-cash-flow expense deduction from income
- This expense deduction reduces the taxes payable
- This tax saving is a cash-flow (the depreciation tax benefit)

### Two Methods of Calculating the After-Tax Cash Flows

<u>Income Statement</u>		<u>Operating Cash Flow Statement</u>	
Revenue	10,000 →	Revenue	10,000
Costs	6,000 →	Costs	<u>6,000</u>
CCA	<u>6,000</u>	NOI	4,000
Taxable		Taxes (40%)	<u>1,600</u>
Income	-2,000	After Tax	
Tax 40%	-800 →	NOI	2,400
	10,000 ←	Depr. Tax	
	-6,000 ←	Benefit	
	<u>-(-800)</u> ←	(.4 x 6,000)	<u>2,400</u>
A/T C/F	<u>4,800</u>	A/T Cash Flow	<u>4,800</u>

# After-Tax Project Analysis Summary

EOY	Capital Costs	Revenues	Exp	BTCF	CCA*	Taxable Income (excluding capital)	Tax	ATCF
0	-FC			-FC				-FC
1		R	E	R-E	C1	R-E-C1	T1	R-E-T1
2		R	E	R-E	C2	R-E-C2	T2	R-E-T2
3		R	E	R-E	C3	R-E-C3	T3	R-E-T3
4		R	E	R-E	C4	R-E-C4	T4	R-E-T4
5		R	E	R-E	C5	R-E-C5	T5	R-E-T5
5	+SV			+SV				+SV
5					**	**	T5.1	-T5.1
	(a)	(b)	(c)	(d)= (a)+(b)+(c)	(e)	(f)=(d)-(e) excluding capital	(g)=t*(f)	(h)= (d)-(g)

\*Important Depreciation

Methods: 1. Straight-Line  
2. CCA (with HYR)

\*\* Compare BV to SV

1. Capital Gain
2. Depreciation Recapture
3. Terminal Loss