Chapter 11: Income Taxes

- This chapter is only an overview of federal income taxes
- Both individuals and corporations pay taxes
- All the tax topics we consider are specific to the US
- We consider only federal taxes
  - States and municipalities also assess various types of taxes (income tax, sales tax, estate tax, securities tax, gasoline tax, property tax, etc.)
- Taxes are intended to pay for government services
  - Many western European countries charge more taxes than the US – they also provide more services than the US does
  - Think of U.S. as a *partner* that shares in the profits/losses of a business
- Taxes are *one more expense*

No realistic economic analysis can ignore taxes

Individual Income Taxes

- How is an individual's income tax calculated?
  - Determine the individual's taxable income
  - Income – allowable deductions
- All information is recorded on Form 1040. Main sections are:
  - Gross Income
  - Adjusted Gross Income
  - Tax and Credits
  - Payment or Refund
- Gross income is the sum of
  - wages, salary, etc.
  - interest/dividend income (e.g., bank savings, stocks, mutual funds)
  - capital gains (e.g., from stocks, mutual funds)
  - unemployment compensation and other income

Individual Income Taxes

- Adjusted gross income (AGI)
  - Gross income – adjustments to income such as retirement plan contributions, SS income, ... ("above the line deductions")
- Tax: Determine your tax liability based on your taxable income
- Taxable Income: AGI – additional deductions such as:
  - Personal Exemptions
    - $3,000 (for 2002) for each person who depends on this income
  - Itemized Deductions, including:
    - Home mortgage interest, state/local income tax, property taxes
    - Charitable contributions, Casualty and theft losses
    - Medical/dental expenses (if they exceed 7.5% of AGI)
  - Standard Deduction (in place of itemized deductions!!)
    - Single taxpayers: $4700 (for 2002)
    - Married taxpayers filing a joint return: $7850 (for 2002)

Individual Income Taxes

- Credits: Reduce your tax liability by any tax credits or pre-payments, such as
  - Child tax credit: $1000 per child (retroactive to 2002)
  - Earned Income Credit
  - Lifetime Learning / Education Credits
- Payment/Refund
  - Compare your "final" amount of tax owed to the amount of federal witholding you contributed periodically over the year
    - Call the witholding amount "Taxes Paid"
    - Usually have federal tax taken out of each paycheck
    - If you own a business, you may pay taxes quarterly
  - If Taxes Owed > Taxes Paid, you need to make a payment
  - If Taxes Owed < Taxes Paid, you will receive a refund

Individual Income Taxes

<u>Summary – Computing Individual Income Taxes</u>

1. Compute gross income
2. Deduct any adjustments such as retirement contributions to find AGI
3. Find taxable income as follows:

   Taxable Income = AGI
   – Personal Exemption(s)
   – Itemized Deductions or Standard Deduction
4. Use taxable income with a tax rate table to find the income tax liability for the year
5. Reduce the income tax liability by any available tax credits

Individual Tax Rates – 1999 vs. 2002

<u>Schedule X: 1999 Tax Rates – Single Filing Status</u>

If your taxable income is over	*but not over*	*Your tax is*	*of the amount over*
$0	25,750	0 + 15%	$0
25,750	62,450	$3,862.50 + 28%	25,750
62,450	130,250	14,138.50 + 31%	62,450
130,250	283,150	35,156.50 + 36%	130,250
283,150		90,200.50 + 39.6%	283,150

<u>Schedule X: 2002 Tax Rates – Single Filing Status</u>

If your taxable income is over	*but not over*	*Your tax is*	*of the amount over*
$0	6,000	0 + 10%	$0
6,000	27,950	$600.00 + 15%	6,000
27,950	67,700	3,892.50 + 27%	27,950
67,700	141,250	14,625.00 + 30%	67,700
141,250	307,050	36,690.00 + 35%	141,250
307,050		94,720.00 + 38.6%	307,050

- Numbers increasing to reflect adjustments for inflation

Individual Tax Rates – Single vs. Married

Schedule X: 2002 Tax Rates – Single Filing Status

If your taxable income is over	*but not over*	*Your tax is*	*of the amount over*
$0	6,000	0 + 10%	$0
6,000	27,950	$600.00 + 15%	6,000
27,950	67,700	3,892.50 + 27%	27,950
67,700	141,250	14,625.00 + 30%	67,700
141,250	307,050	36,690.00 + 35%	141,250
307,050		94,720.00 + 38.6%	307,050

Schedule Y-1: 2002 Tax Rates – Married Filing Jointly

If your taxable income is over	*but not over*	*Your tax is*	*of the amount over*
$0	$12,000	0 + 10%	$0
12,000	46,700	$1,200.00 + 15%	12,000
46,700	112,850	$6,405.00 + 27%	46,700
112,850	171,950	24,265.50 + 30%	112,850
171,950	307,050	41,995.50 + 35%	171,950
307,050		89,280.50 + 38.6%	307,050

- Notice that the taxable income levels are not twice as high!!!

Individual Tax Rates – "Marriage Penalty"

Example

- An unmarried person with a taxable income of $50,000 would pay
  $3,892.50 + 0.27(50,000 – 27,950) = $9,846.00
- A couple with a taxable income of $50,000 would pay
  $6,405.00 + 0.27(50,000 – 46,700) = $8,376.00
- A couple with a taxable income of $100,000 would pay
  $6,405.00 + 0.27(100,000 – 46,700) = $20,796.00

Conclusion

- Couple benefits when there is a single wage earner in the household
- However, two unmarried people making $50,000 each have a lower federal tax liability than two married people making a total of $100,000
- There are other deductions which benefit married couples and/or families

Example 1 – Individual Income Taxes

Example

Bill is an unmarried student. He earned $8,000 in the summer, plus another $2,000 during the rest of the year. When he files his income tax return, he is allowed one exemption. He estimates he spent $1000 on allowable itemized deductions. How much income tax does he pay?

Solution

Adjusted gross income (AGI) = $8,000 + 2,000 = $10,000

Taxable income = AGI
– Deduction for one exemption
– Standard deduction
= 10,000 – 3,000 – 4,700 = $2,300

Federal income tax = 0.10 (2300) = $230.00

Federal income tax (from Tax Tables) = $231

Example 2 – Individual Income Taxes

Example

Jill is single with one child. She earns $25,000 per year, and she donates a total of $1,500 to her church and other activities. How much income tax does she pay?

Solution

Adjusted gross income (AGI) = $25,000

Taxable income = AGI
– Deduction for two exemptions
– Standard deduction (since it's > $1500)
= 25,000 – 6,000 – 4,700 = $14,300

Federal income tax = 600 + 0.15 (14,300 – 6,000) = $1,845.00

Federal income tax (from Tax Tables) = $1,849

Total Tax Due = Tax liability – Child tax credit = 1,849 – 1000
= $849

Example 3 – Individual Income Taxes

Example

Steve and Karen are married with no children. Their combined annual salary is $80,000. They put $10,000 into 401k plans with their employers, and they receive $2,000 in interest income from savings. They pay $8,000 in mortgage interest, $4,000 in property taxes, and they give $2,000 to charity. Karen's father also gave them a one-time gift of $11,000. How much income tax do Steve and Karen pay?

Solution

Adjusted gross income (AGI) = $80,000 – 10,000 – 2,000 = $68,000

Itemized deductions = 8,000 + 4,000 + 2,000 = $14,000

Taxable income = AGI – 2 exemptions – itemized deduction

= 68,000 – 6,000 – 14,000 = $48,000

Federal income tax = 6,405 + 0.27 (68,000 – 46,700) = $6,756.00

Federal income tax (from Tax Tables) = $6,763

- Gift has no relevance in calculating tax amount…the giver and receiver of the gift will not be taxed when this gift is less than $11,000 (see Gift and Estate Tax)

Corporate Income Taxes (2000)

(dollars in millions)

Company	Gross Income	Taxable Income	Income Taxes	Net Income	Average Tax Rate
Intel	$33,726	$15,141	$4,606	$10,535	30.42%
Cisco	18,920	4,343	1,675	2,668	38.57%
Amazon	2,762	(1,707)	0	(1,411)	0%
Broadcom	1,132	339	68	271	20.00%
Oracle	17,173	10,232	3,827	6,297	37.80%

Corporate Income Taxes – Business Expenditures

Classification of Business Expenditures

- Capital expenditures include:
  1) Expenditures for depreciable assets (e.g., buildings)
     - This is the subject of Chapter 10
  2) Expenditures for non-depreciable assets (e.g., land, minerals)
     - Small category…typically land and assets subject to depletion
- Expense expenditures include:
  1) All other business expenditures (e.g., labor, materials)
     - Ordinary and necessary expenditures of operating a business
       - labor costs
       - materials
       - all direct and indirect costs
       - facilities/equipment with a useful life of one year or less
       - any interest expenses due to borrowed money

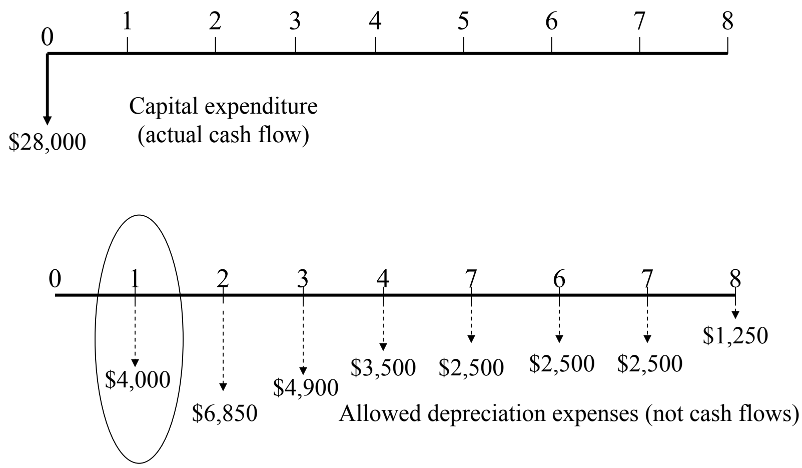
Corporate Income Taxes – Business Expenditures

Taxable Income of Business Firms

Taxable income = Gross income
– Expense expenditures
– Depreciation and depletion charges

- Non-taxable items include cash flows for
  - Working capital
  - Capital expenditures
  - Loans and repayment of principal amounts
- Capital expenditures are charged to accounting records each period through depreciation or depletion charges (land is the notable exception)

Capital Expenditure vs. Depreciation Expense



Using Cash Flows for Project Evaluation

		Company A	Company B
Year 1	Net income	$1,000,000	$1,000,000
	Cash flow	1,000,000	0
Year 2	Net income	1,000,000	1,000,000
	Cash flow	1,000,000	2,000,000

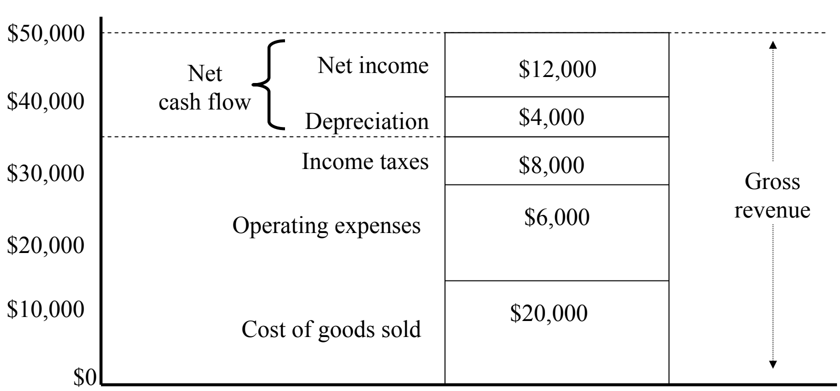
- Both companies (A & B) have the same amount of net income and cash sum over 2 years. Is Net Income or Net Cash Flow a better indicator of performance?
- Net income
  - An accounting means of measuring a firm’s profitability
  - The actual timing of cash inflows and outflows are ignored
- Cash flow
  - Given the *time value of money*, it is better to receive cash now rather than later, because cash can be invested to earn more money
  - Cash flows are more relevant in for evaluating projects!!
  - Company A can invest $1 million in year 1
  - Company B has nothing to invest during the same period

Example 11.2 – Cash Flow versus Net Income

Item	Income	Cash Flow
Gross income (revenue)	$50,000	$50,000
Expenses		
Cost of goods sold	20,000	-20,000
Depreciation	4,000	
Operating expenses	6,000	-6,000
Taxable income	20,000	
Taxes (40%)	8,000	-8,000
Net income	$12,000	
Net cash flow		$16,000

Example 11.2 – Cash Flow versus Net Income

Net cash flows = Net income + non-cash expense (depreciation)



Taxpayers Relief Act of 1997 (Capital Gains and Losses)

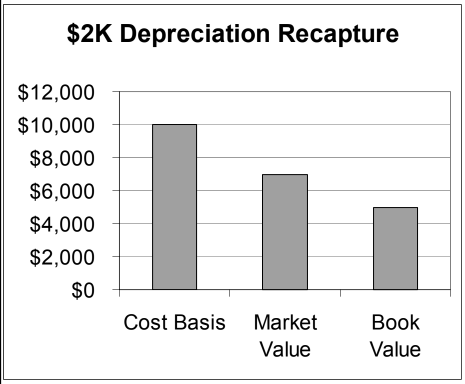
For Individuals:	
Capital gain	For assets held for less than 1 year, taxed as ordinary income. (*Short-Term*) For assets held for 1 year to 18 months, taxed at 28% tax rate. For assets held for more than 18 months, taxed at 20% tax rate. (*Long-Term*)
Capital loss	Subtract capital losses from any capital gains. The balance may be deducted from ordinary income, but not more than $3,000 per year
For Corporations:	
Capital gain	Taxed as ordinary income.
Capital loss	Corporations may deduct capital losses only to the extent of capital gains. Any capital loss in the current year that exceeds capital gains is carried back three years and, if not completely absorbed, is then carried forward for up to five years.

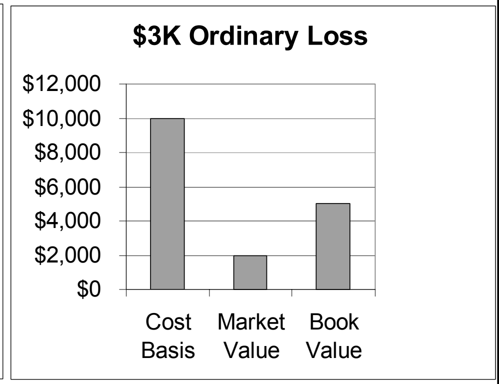
- Taxpayers in 15% tax bracket – long term capital gains are taxed at 10%
- Exclusion of gain on the sale of a principal residence
  – Exclusion is for $250,000 ($500,000 for a couple filing jointly) for the residence if held for two years or more
  – This exclusion can be repeatedly used

Capital Gains and Losses (MACRS Property)

- Gains (losses) = Salvage (Market) value - Book value
- Rare Case: A*sset is sold for an amount greater than its cost basis*.
- Gains are divided into two parts for tax purposes:
  – Gains = Capital gains + Ordinary gains
  – Capital gains = Salvage (Market) value – cost basis
  – Ordinary gains = Cost basis – book value = depreciation recapture
- Distinction allows
  – Capital gains to be taxed at the capital gain tax rate
  – Ordinary gains to be taxed at the ordinary income tax rate
- Taxed as ordinary income under current tax law → Ordinary Gains
- Congress could give preferential treatment for capital gains. *Capital gains and ordinary gains may be taxed at different rates in the future*
- NOTE: Tax laws also include "carry forward" or "carry backward" provisions to transfer deductions to profitable years

Depreciation and Asset Disposal

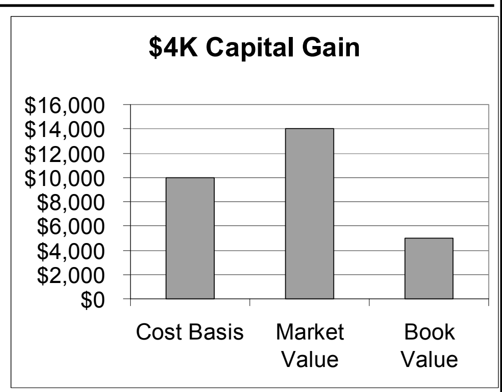




- When we dispose of an asset:
  - If market value exceeds book value, but *is no more than the cost basis*, the difference is called the depreciation recapture, or ordinary gains
  - If book value exceeds market value, the difference is called an ordinary loss

Depreciation and Asset Disposal

- If market value exceeds the cost basis, the difference is called capital gains
- In this case the depreciation recapture is the difference between the cost basis and the book value (e.g., $5K)
- Capital gains are very uncommon in most engineering economic analyses



- Summary (Given $B \geq BV$):

Case	*MV Range*	*Result*
1.	$B \geq MV \geq BV$	Depreciation recapture = ordinary gain = MV – BV
2.	$B \geq BV > MV$	Ordinary loss = BV – MV
3.	$MV > B \geq BV$	Capital gain = MV – B (Depreciation recapture = B – BV)

Disposal Prior To End of Depreciable Life

- If the asset is in the middle of its depreciable life, a full-year depreciation is not allowed
  - For a 5-year asset disposed of in year 4, the *MACRS depreciation rate is half of the regular rate* (half of 11.52% is 5.76%)
  - The assumption is disposals take place ½ way through the year

Example

An asset has a cost basis of \$10,000. It is a 3-year MACRS property. Calculate the effect of disposal if the asset is:

a) sold in year 2 for \$2,500
b) sold in year 3 for \$2,500

Solution

a) Verify (book) BV = \$4,444.50 (use ½ year for year 2). Since MV = \$2,500, BV > MV -- Loss = \$1,944.50
b) Verify (book) BV = \$1,481.50 (use ½ year for year 3). Since MV = \$2,500, MV > BV
   Depreciation Recapture = 2,500 – 1,481.50 = \$1,018.50

Example – Capital Gains/Losses (Depreciable Assets)

GatorGo Corp. purchased a drill press costing \$230,000 in year 0. The drill press, classified as 7-year recovery property, has been depreciated with the MACRS method. It will be sold after three years. We want to compute the gains (losses) for the following four salvage values:

1) \$150,000
2) \$120,693
3) \$100,000
4) \$250,000

Both capital gains and ordinary income are taxed at 34%.

- Cost basis = \$230,000
- Total allowed depreciation = \$230,000(0.1429 + 0.2449 + 0.1749/2)
  = \$109,308
- Book value = \$230,000 – 109,308
  = \$120,693

Example – Capital Gains/Losses (Depreciable Assets)

Case 1: Book value < Salvage value < Cost basis

- There are no capital gains to consider. All gains are ordinary gains
- Ordinary gains = Salvage value – book value
  = $150,000 - $120,693
  = $29,308
- Gains tax (at 34%) = 0.34 (29,308) = $9965
- Net proceeds = Salvage value – gains tax
  = $150,000 - $9965
  = $140,035

Case 2: Salvage value = Book value

- Since the press salvage value equals the book value, no taxes are levied on the salvage value
- Net proceeds = $150,000

Example – Capital Gains/Losses (Depreciable Assets)

Case 3: Salvage value < Book value

- This case illustrates a loss. Compute the net salvage value after tax:
- Gain (loss, actually) = Salvage value – Book value
  = 100,000 – 120,693 = -$20,693
- *Tax savings* = 0.34 (20,693) = $7,036.
- Net proceeds = $100,000 + $7036
  = $107,036

Case 4: Salvage value > Cost basis

- Unlikely for most depreciable assets (except for land)
- Capital gains = Salvage value – Cost basis
  = $250,000 - $230,000 = $20,000
- Capital gains tax = (0.34) $20,000 = $6,800
- Ordinary gains = $230,000 - $120,693 = $109,307
- Gains tax = (0.34) 109,307 = $37,164
- Net proceeds = $250,000 – (6800 + 37,164)
  = $206,036

Calculating Corporate Income Taxes

<u>Computing Corporate Income Taxes</u>

1. Compute gross income
2. Deduct all ordinary and necessary expenditures (except capital expenditures)
3. Deduct depreciation and depletion charges
4. The result is taxable income
5. Use taxable income with a tax rate table to find the income tax liability for the year

Corporate Tax Rates

- Income tax for corporations is computed in a manner similar to that for individuals

If taxable income is over	*but not over*	*Tax is*	*of the amount over*
	50,000	0 + 15%	$0
50,000	75,000	7,500 + 25%	50,000
75,000	100,000	13,750 + 34%	75,000
100,000	335,000	22,250 + 39%	100,000
335,000	10 million	113,900 + 34%	335,000
10 million	15 million	3,400,000 + 35%	10 million
15 million	18,333,333	5,159,000 + 38%	15 million

- Note the bracket with a 39% rate between two brackets with 34% rates
- The 5% surtax results in essentially a flat tax of 34% for corporations between $335k and $10M

Example – Corporate Income Taxes

Example

The French Chemical Corp. was formed to make household bleach. The firm bought land for $220,000, had a $900,000 factory building erected, and installed $650,000 worth of chemical and packaging equipment.

The plant was opened on April 1st. Gross income for the calendar year was $450,000. Supplies and all operating expenses, excluding the capital expenditures, were $100,000. The firm will use MACRS depreciation.

First-year depreciation charge

- Chemical equipment is personal property. Table 10-3 suggests it falls into the "7-year, all other property" class

  First-year depreciation = 14.29% of $650,000 = $92,885
- Building: 39-year real property class; in service on April 1st

  First-year depreciation = 1.816% of $900,000 = $16,344
- Land is non-depreciable
- Total first-year MACRS depreciation = $109,229

Example – Corporate Income Taxes

Example (continued)

First-year taxable income

- Taxable income = $450,000 - $100,000 - $109,229

  = $240,771

First-year federal taxes

- From the tax table, the company is in the 39% bracket
- Federal income tax = $22,250 + 0.39(240,771-100,000)

  = $77,150

Combined Federal and State Income Taxes

- Most (but not all) states have an income tax
  - State taxes are allowable deductions for itemized federal taxes. The converse is not true, unfortunately
  - Thus state income taxes are based on a larger taxable income than federal income taxes
- FTR: Federal Tax Rate, STR: State Tax Rate, Δ: Incremental

  State income tax = (ΔSTR) (ΔIncome)

  Federal taxable income = ΔIncome – State income tax
  = (1 - ΔSTR) (ΔIncome)

  Federal income taxes = ΔFTR (1 - ΔSTR) (ΔIncome)

- Combined taxes = [ΔSTR + ΔFTR (1 - ΔSTR)] × (ΔIncome)
- *Combined tax rate = [ΔSTR + ΔFTR (1-STR)]*

  $t_m = t_f + t_s - t_f t_s$

Example – Federal and State Income Taxes

Example

Tom is in the 28% federal inc. tax bracket and the 10% state income tax bracket. He makes an *incremental* income of $500 consulting.

Solution – Method 1

- State inc tax = 0.1 (500) = 50
- Fed taxable inc = 500 – 50 = 450 = 500(1- 0.1)
- Fed inc taxes = 0.28 (450) = 126 = 0.28 (500)(1-0.1)
- Combined taxes = 50 + 126 = $176

Solution – Method 2

- ΔSTR = 10% ΔFTR = 28% Δincome = $500
- Combined incremental tax rate = 0.1 + 0.28(1 – 0.1) = 0.352
- Combined taxes = 0.352 (500) = $176

- Remark. Combined tax formulas assume the incremental income does not cause Tom to change tax brackets!!!

Incremental Income Tax Rate

	Before Undertaking Project	After Undertaking Project	The Effect of Project
Gross revenue	$200,000	$240,000	$40,000
Expenses	130,000	150,000	20,000
Taxable income	$70,000	$90,000	$20,000
Income taxes	$12,500	$18,850	$6,350

Average tax rate	17.86%	20.94%	31.75%
Marginal tax rate	25%	34%	

Incremental rate

Conclusion

- In the incremental analysis, use the appropriate incremental tax rate that applies to the change in projected income

Expense or Capitalize – Section 179 Deductions for 2002

- Allows small corporations to expense (or depreciate over 1 year) up to $25,000 in capital assets
- This deduction must not create a loss
- Phased out for investments over $200,000
  - If equipment costs $210,000, then the maximum allowable Section 179 deduction is ($25,000 – $10,000) = $15,000
- Why depreciate instead of expense?
  - Depreciating will more evenly distribute your capital costs from year-to-year
  - This may be more desirable in terms of financial reporting
    - Income statement is more stable
    - Reported earnings are more predictable
- Passenger vehicles under 6,000 lbs not included as assets
- Rules are changing for 2003

Investment Tax Credit

- Government can alter tax laws to *stimulate the economy*
- The *investment tax credit* was used to stimulate capital investments
  - The Tax Reform Act of 1986 has made this credit unavailable, but it may reappear some day
  - Businesses could deduct from 4% to 8% of their new business equipment purchases as a tax credit
  - Net cost of equipment was reduced
  - But the basis for computing depreciation is unchanged!!!
- <u>Example (4% tax credit)</u>
  - A firm buys a bulldozer for $200,000
  - The tax credit is $0.04 \times 200{,}000 = \$8{,}000$
  - The firm reduces the taxes it pays by $8,000, but it uses $200,000 as the value of the bulldozer for computing depreciation