Financial Management Theory and Practice 15th edition Brigham Solutions Manual

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Chapter 2
Financial Statements, Cash Flow, and Taxes

ANSWERS TO END-OF-CHAPTER QUESTIONS

2-1 a. The annual report is a report issued annually by a corporation to its stockholders. It contains basic financial statements, as well as management's opinion of the past year's operations and the firm's future prospects. A firm's balance sheet is a statement of the firm's financial position at a specific point in time. It specifically lists the firm's assets on the left-hand side of the balance sheet, while the right-hand side shows its liabilities and equity, or the claims against these assets. An income statement is a statement summarizing the firm's revenues and expenses over an accounting period. Net sales are shown at the top of each statement, after which various costs, including income taxes, are subtracted to obtain the net income available to common stockholders. The bottom of the statement reports earnings and dividends per share.

b. Common Stockholders' Equity (Net Worth) is the capital supplied by common stockholders--capital stock, paid-in capital, retained earnings, and, occasionally, certain reserves. Paid-in capital is the difference between the stock's par value and what stockholders paid when they bought newly issued shares. Retained earnings is the portion of the firm's earnings that have been saved rather than paid out as dividends.

c. The statement of stockholders' equity shows how much of the firm's earnings were retained in the business rather than paid out in dividends. It also shows the resulting balance of the retained earnings account and the stockholders' equity account. Note that retained earnings represents a claim against assets, not assets per se. Firms retain earnings primarily to expand the business, not to accumulate cash in a bank account. The statement of cash flows reports the impact of a firm's operating, investing, and financing activities on cash flows over an accounting period.

d. Depreciation is a non-cash charge against tangible assets, such as buildings or machines. It is taken for the purpose of showing an asset's estimated dollar cost of the capital equipment used up in the production process. Amortization is a non-cash charge against intangible assets, such as goodwill. EBITDA is earnings before interest, taxes, depreciation, and amortization.

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e. Operating current assets are the current assets used to support operations, such as cash, accounts receivable, and inventory. It does not include short-term investments. Operating current liabilities are the current liabilities that are a natural consequence of the firm's operations, such as accounts payable and accruals. It does not include notes payable or any other short-term debt that charges interest. Net operating working capital is operating current assets minus operating current liabilities. Total net operating capital is sum of net operating working capital and operating long-term assets, such as net plant and equipment. Operating capital also is equal to the net amount of capital raised from investors. This is the amount of interest-bearing debt plus preferred stock plus common equity minus short-term investments.

f. Accounting profit is a firm's net income as reported on its income statement. Net cash flow, as opposed to accounting net income, is the sum of net income plus non-cash adjustments. NOPAT, net operating profit after taxes, is the amount of profit a company would generate if it had no debt and no financial assets. Free cash flow is the cash flow actually available for distribution to investors after the company has made all investments in fixed assets and working capital necessary to sustain ongoing operations. Return on invested capital is equal to NOPAT divided by total net operating capital. It shows the rate of return that is generated by assets.

g. Market value added is the difference between the market value of the firm (i.e., the sum of the market value of common equity, the market value of debt, and the market value of preferred stock) and the book value of the firm's common equity, debt, and preferred stock. If the book values of debt and preferred stock are equal to their market values, then MVA is also equal to the difference between the market value of equity and the amount of equity capital that investors supplied. Economic value added represents the residual income that remains after the cost of all capital, including equity capital, has been deducted.

h. A progressive tax means the higher one's income, the larger the percentage paid in taxes. Taxable income is defined as gross income less a set of exemptions and deductions which are spelled out in the instructions to the tax forms individuals must file. Marginal tax rate is defined as the tax rate on the last unit of income. Average tax rate is calculated by taking the total amount of tax paid divided by taxable income.

i. Capital gain (loss) is the profit (loss) from the sale of a capital asset for more (less) than its purchase price. Ordinary corporate operating losses can be carried backward for 2 years or forward for 20 years to offset taxable income in a given year.

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j. Improper accumulation is the retention of earnings by a business for the purpose of enabling stockholders to avoid personal income taxes on dividends. An S corporation is a small corporation which, under Subchapter S of the Internal Revenue Code, elects to be taxed as a proprietorship or a partnership yet retains limited liability and other benefits of the corporate form of organization.

2-2 The four financial statements contained in most annual reports are the balance sheet, income statement, statement of stockholders' equity, and statement of cash flows.

2-3 No, because the $20 million of retained earnings doesn't mean the company has $20 million in cash. The retained earnings figure represents cumulative amount of net income that the firm has not paid out as dividends during its entire history. Thus, most of the reinvested earnings were probably spent on the firm's operating assets, such as buildings and equipment.

2-5 Operating capital is the amount of interest bearing debt, preferred stock, and common equity used to acquire the company's net operating assets. Without this capital a firm cannot exist, as there is no source of funds with which to finance operations.

2-6 NOPAT is the amount of net income a company would generate if it had no debt and held no financial assets. NOPAT is a better measure of the performance of a company's operations because debt lowers income. In order to get a true reflection of a company's operating performance, one would want to take out debt to get a clearer picture of the situation.

2-7 Free cash flow is the cash flow actually available for distribution to investors after the company has made all the investments in fixed assets and working capital necessary to sustain ongoing operations. It is the most important measure of cash flows because it shows the exact amount available to all investors.

2-8 If the business were organized as a partnership or a proprietorship, its income could be taken out by the owners without being subject to double taxation. Also, if you expected to have losses for a few years while the company was getting started, if you were *not* incorporated, and if you had outside income, the business losses could be used to offset your other income and reduce your total tax bill. These factors would lead you to *not* incorporate the business. An alternative would be to organize as an S Corporation, if requirements are met.

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SOLUTIONS TO END-OF-CHAPTER PROBLEMS

2-1 Corporate yield = 9%; T = 35.5%
AT yield = 9%(1 - T)
= 9%(0.645) = 5.76%.

2-2 Corporate bond yields 8%. Municipal bond yields 6%.

$$\text{Equivalent pretax yield on taxable bond} = \frac{\text{Yield on muni}}{(1-T)}$$

$$8\% = \frac{6\%}{(1-T)}$$

$$0.08 - 0.08T = 0.06$$

$$-0.08T = -0.02$$

$$T = 25\%.$$

2-3 NI = $6,000,000; EBIT = $13,000,000; T = 40%; Interest = ?
Need to set up an income statement and work from the bottom up.

EBIT	$13,000,000
Interest	3,000,000
EBT	$10,000,000
Taxes (40%)	4,000,000
NI	$6,000,000

$$EBT = \frac{\$6,000,000}{(1-T)} = \frac{\$6,000,000}{0.6}$$

Interest = EBIT – EBT = $13,000,000 – $10,000,000 = $3,000,000.

2-4 EBITDA = $8,000,000; NI = $2,400,000; Int = $2,000,000; T = 40%; DA = ?

EBITDA	$8,000,000	
DA	2,000,000	EBITDA – DA = EBIT; DA = EBITDA – EBIT
EBIT	$6,000,000	EBIT = EBT + Int = $4,000,000 + $2,000,000
Int	2,000,000	(Given)
EBT	$4,000,000	$\rightarrow \frac{\$2,400,000}{(1-T)} = \frac{\$2,400,000}{0.6}$
Taxes (40%)	1,600,000	
NI	$2,400,000	(Given)

2-5 NI = $3,100,000; DEP = $500,000; AMORT = 0; NCF = ?
NCF = NI + DEP and AMORT = $3,100,000 + $500,000 = $3,600,000.

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2-6 NI = \$70,000,000; $R/E_{Y/E}$ = \$900,000,000; $R/E_{B/Y}$ = \$855,000,000; Dividends = ?

$$R/E_{B/Y} + NI - Div = R/E_{Y/E}$$
$$\$855,000,000 + \$70,000,000 - Div = \$900,000,000$$
$$\$925,000,000 - Div = \$900,000,000$$
$$\$25,000,000 = Div.$$

2-7

Pre-tax operating earnings	\$365,000
Less Interest deduction	(50,000)
Plus: Dividends received[a]	4,500
Taxable income	\$319,500

[a]For a corporation, 70% of dividends received are excluded from taxes; therefore, taxable dividends are calculated as \$15,000(1 - 0.70) = \$4,500.

Tax = \$22,250 + (\$319,500 - \$100,000)(0.39) = \$22,250 + \$85,605 = \$107,855.

After-tax income:

Taxable income	\$319,500
Taxes	(107,855)
Plus Non-taxable dividends received[b]	10,500
Net income	\$222,145

[b]Non-taxable dividends are calculated as \$15,000 x 0.7 = \$10,500.

The company's marginal tax rate is 39 percent. The company's average tax rate is \$107,855/\$319,500 = 33.76%.

2-8 a. Tax = \$3,400,000 + (\$10,500,000 - \$10,000,000)(0.35) = \$3,575,000.

b. Tax = \$1,000,000(0.35) = \$350,000.

c. Tax = (\$1,000,000)0.30(0.35) = \$105,000.

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2-9 A-T yield on FLA bond = 5%.

A-T yield on AT&T bond = 7.5% - Taxes = 7.5% - 7.5%(0.35) = 4.875%.

Check: Invest $10,000 @ 7.5% = $750 interest.
Pay 35% tax, so A-T income = $750(1 - T) = $750(0.65) = $487.50.

A-T rate of return = $487.50/$10,000 = 4.875%.

A-T yield on AT&T preferred stock:

A-T yield = 6% - Taxes = 6% - 0.3(6%)(0.35) = 6% - 0.63% = 5.37%.

Therefore, invest in AT&T preferred stock. We could make this a harder problem by asking for the tax rate that would cause the company to prefer the Florida bond or the AT&T bond.

2-10 EBIT = $750,000; DEP = $200,000; 100% Equity; T = 40%
NI = ?; NCF = ?; OCF = ?

First, determine net income by setting up an income statement:

EBIT	$750,000
Interest	0
EBT	$750,000
Taxes (40%)	300,000
NI	$450,000

NCF = NI + DEP = $450,000 + $200,000 = $650,000.

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2-11 a.

	Income Statement
Sales revenues	$12,000,000
Costs except depreciation	9,000,000
Depreciation	1,500,000
EBT	$ 1,500,000
Taxes (40%)	600,000
Net income	$ 900,000
Add back depreciation	1,500,000
Net cash flow	$ 2,400,000

b. If depreciation doubled, taxable income would fall to zero and taxes would be zero. Thus, net income would decrease to zero, but net cash flow would rise to $3,000,000. Menendez would save $600,000 in taxes, thus increasing its cash flow:

$$\Delta CF = T(\Delta Depreciation) = 0.4(\$1,500,000) = \$600,000.$$

c. If depreciation were halved, taxable income would rise to $2,250,000 and taxes to $900,000. Therefore, net income would rise to $1,350,000, but net cash flow would fall to $2,100,000.

d. You should prefer to have higher depreciation charges and higher cash flows. Net cash flows are the funds that are available to the owners to withdraw from the firm and, therefore, cash flows should be more important to them than net income.

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2-12 a.

EBIT	$1,260
x (1-Tax rate)	60.0%
Net operating profit after taxes (NOPAT)	$756

b.

	2016	2015
Cash	$550	$500
+ Accounts receivable	2,750	2,500
+ Inventories	1,650	1,500
Operating current assets	$4,950	$4,500
Accounts payable	$1,100	$1,000
+ Accruals	550	500
Operating current liabilities	$1,650	$1,500
Operating current assets	$4,950	$4,500
- Operating current liabilities	1,650	1,500
Net operating working capital (NOWC)	$3,300	$3,000

c.

	2016	2015
Net operating working capital (NOWC)	$3,300	$3,000
+ Net plant and equipment	3,850	3,500
Total net operating capital	$7,150	$6,500

d.

	2016
NOPAT	$756
- Investment in total net operating capital	650
Free cash flow	$106

e.

	2016
NOPAT	$756
÷ Total net operating capital	7,150
Return on invested capital (ROIC)	10.57%

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f.

Uses of FCF	**2016**
After-tax interest payment =	$72
Reduction (increase) in debt =	-$284
Payment of dividends =	$220
Repurchase (Issue) stock =	$88
Purchase (Sale) of short-term investments =	$10
Total uses of FCF =	$106

2-13

Prior Years	2014	2015
Profit earned	$150,000	$150,000
Carry-back credit	150,000	150,000
Adjusted profit	$ 0	$ 0
Tax previously paid (40%)	60,000	60,000
Tax refund: Taxes previously paid	$ 60,000	$ 60,000

2016 total refund check from U.S. Treasury = $60,000 + $60,000 = $120,000.

Future Years	2017	2018	2019	2020	2021
Estimated profit	$150,000	$150,000	$150,000	$150,000	$150,000
Carry-forward credit	150,000	150,000	50,000	0	0
Adjusted profit	$ 0	$ 0	$100,000	$150,000	$150,000
Tax (at 40%)	0	$ 0	$ 40,000	$ 60,000	$ 60,000

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SOLUTION TO SPREADSHEET PROBLEM

2-14 The detailed solution for the spreadsheet problem, ***Ch02 P14 Build a Model Solution.xlsx*** is available at the textbook's Web site**.**

2-15 The detailed solution for the spreadsheet problem, ***Ch02 P15 Build a Model Solution.xlsx*** is available at the textbook's Web site**.**

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MINI CASE

Jenny Cochran, a graduate of The University of Tennessee with 4 years of experience as an equities analyst, was recently brought in as assistant to the chairman of the board of Computron Industries, a manufacturer of computer components.

During the previous year, Computron had doubled its plant capacity, opened new sales offices outside its home territory, and launched an expensive advertising campaign. Cochran was assigned to evaluate the impact of the changes. She began by gathering financial statements and other data. Note: these are available in the file *Ch02 Tool Kit.xlsx* in the *Mini Case* tab.

Balance Sheets

Assets	2015	2016
Cash	$ 9,000	$ 7,282
Short-term investments.	48,600	20,000
Accounts receivable	351,200	632,160
Inventories	715,200	1,287,360
total current assets	$ 1,124,000	$ 1,946,802
Gross fixed assets	491,000	1,202,950
Less: accumulated depreciation	146,200	263,160
net fixed assets	$ 344,800	$ 939,790
Total assets	$ 1,468,800	$ 2,886,592

Liabilities and equity	2014	2015
Accounts payable	$ 145,600	$ 324,000
Notes payable	200,000	720,000
Accruals	136,000	284,960
total current liabilities	$ 481,600	$ 1,328,960
Long-term debt	323,432	1,000,000
Common stock (100,000 shares)	460,000	460,000
Retained earnings	203,768	97,632
total equity	$ 663,768	$ 557,632
Total liabilities and equity	$ 1,468,800	$ 2,886,592

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Income Statements

	2015	2016
Sales	$ 3,432,000	$ 5,834,400
Cost of goods sold	2,864,000	4,980,000
Other expenses	340,000	720,000
Depreciation	18,900	116,960
total operating costs	$ 3,222,900	$ 5,816,960
EBIT	$ 209,100	$ 17,440
Interest expense	62,500	176,000
Pretax earnings	$ 146,600	$ (158,560)
Taxes (40%)	58,640	(63,424)
Net income	$ 87,960	$ (95,136)

Other data	2014	2015
Stock price	$ 8.50	$ 6.00
Shares outstanding	100,000	100,000
EPS	$ 0.880	$ (0.951)
DPS	$ 0.220	$ 0.110

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Statement of Cash Flows

Operating activities	
Net income	$ (95,136)
Adjustments:	
noncash adjustments:	
depreciation	116,960
changes in working capital:	
change in accounts receivable	(280,960)
change in inventories	(572,160)
change in accounts payable	178,400
change in accruals	148,960
Net cash provided by operating activities	$ (503,936)
Investing activities	
Cash used to acquire fixed assets	$ (711,950)
Cash due to change in short term investments	$ 28,600
Net cash provided by operating activities	$ (683,350)
Financing activities	
change in notes payable	$ 520,000
change in long-term debt	$ 676,568
change in common stock	$ -
payment of cash dividends	$ (11,000)
Net cash provided by financing activities	$ 1,185,568
Summary	
Net change in cash	$ (1,718)
Cash at beginning of year	9,000
Cash at end of year	$ 7,282

a. What effect did the expansion have on sales and net income? What effect did the expansion have on the asset side of the balance sheet? What effect did it have on liabilities and equity?

Answer: Sales increased by over by over $2.4 million, but net income fell by over $190,000. Assets almost doubled. Debt and funds provided by suppliers increased, but retained earnings fell due to the year's loss.

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b. What do you conclude from the statement of cash flows?

Answer: Net CF from operations = -$503,936, because of negative net income and increases in working capital. The firm spent $711,950 on FA. The firm borrowed heavily and sold some short-term investments to meet its cash requirements. Even after borrowing, the cash account fell by $1,718.

c. What is free cash flow? Why is it important? What are the five uses of FCF?

Answer: FCF is the amount of cash available from operations for distribution to all investors (including stockholders and debtholders) after making the necessary investments to support operations. A company's value depends upon the amount of FCF it can generate.

1. Pay interest on debt.
2. Pay back principal on debt.
3. Pay dividends.
4. Buy back stock.
5. Buy nonoperating assets (e.g., marketable securities, investments in other companies, etc.)

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d. **What is Computron's net operating profit after taxes (NOPAT)? What are operating current assets? What are operating current liabilities? How much net operating working capital and total net operating capital does Computron have?**

Answer: NOPAT = EBIT(1 - TAX RATE)

Current year:
NOPAT = $17,440(1 - 0.4)
= $10,464.

Previous year:
NOPAT = $125,460.

Operating current assets are the CA needed to support operations. OP CA include: cash, inventory, receivables. OP CA exclude: short-term investments, because these are not a part of operations. Operating current liabilities are the CL resulting as a normal part of operations. OP CL include: accounts payable and accruals. OP CA exclude: notes payable, because this is a source of financing, not a part of operations.

NOWC = operating CA – operating CL

Current year:
NOWC = ($7,282 + $632,160 + $1,287,360) - ($324,000 + $284,960)
= $1,317,842.

Previous year:
NOWC = $793,800.

Total operating working capital = NOWC + net fixed assets.

Current year:
Operating capital = $1,317,842 + $939,790
= $2,257,632.

Previous year:
Operating capital = $1,138,600.

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e. **What is Computron's free cash flow (FCF)? What are Computron's "net uses" of its FCF?**

Answer: **FCF = NOPAT - Net investment in capital**
= $10,464 - ($2,257,632 - $1,138,600)
= $10,464 - $1,119,032
= -$1,108,568.

Uses of FCF:	**2015**
After-tax interest payment =	$105,600
Reduction (increase) in debt =	−$1,196,568
Payment of dividends =	$11,000
Repurchase (Issue) stock =	$0
Purchase (Sale) of short-term investments =	−$28,600
Total uses of FCF =	−$1,108,568

f. **Calculate Computron's return on invested capital (ROIC). Computron has a 10% cost of capital (WACC). What caused the decline in the ROIC? Was it due to operating profitability or capital utilization? Do you think Computron's growth added value?**

Commented [MCE1]: revised

ANSWER: ROIC = NOPAT / TOTAL NET OPERATING CAPITAL.

Current year:
ROIC = $10,464 / $2,257,632
= 0.5%.

Previous year:
ROIC = 11.0%.

Current year:
OP = $10,464 / $5,834,400
= 0.18%.

Previous year:
OP = 2.15%.

Current year:
CR = $2,257,632 / $5,834,400
= 38.7%.

Previous year:
CR = 19.5%.

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The current ROIC of 0.5% dropped from 11% in the previous year. This decline was due to worse operating profitability (0.18% versus 2.15%) and worse capital utilization (CR ratio of 38.7% versus a CR ratio of 19.5%). The ROIC is less than the WACC of 10%. Investors did not get the return they require. Note: high growth usually causes negative FCF (due to investment in capital), but that's OK if ROIC > WACC. For example, home depot has high growth, negative FCF, but a high ROIC.

g. Cochran also has asked you to estimate Computron's EVA. She estimates that the after-tax cost of capital was 10 percent in both years.

ANSWER: EVA = NOPAT- (WACC)(CAPITAL).

Current year:
EVA = $10,464 - (0.1)($2,257,632)
= $10,464 - $225,763
= -$215,299.

Previous year:
EVA = $125,460 - (0.10)($1,138,600)
= $125,460 - $113,860
= $11,600.

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h. What happened to Computron's market value added (MVA)?

Answer: MVA = market value of the firm - book value of the firm.

Market value = (# shares of stock)(price per share) + value of debt**.**

Book value = total common equity + value of debt.

If the market value of debt is close to the book value of debt, then MVA is market value of equity minus book value of equity. Assume market value of debt equals book value of debt.

Current year:
Market value of equity = (100,000)($6.00) = $600,000.
Book value of equity = $557,632.
MVA = $600,000 - $557,632 = $42,368.

Previous year:
MVA = $850,000 - $663,768 = $186,232.

i. Assume that a corporation has $100,000 of taxable income from operations plus $5,000 of interest income and $10,000 of dividend income. What is the company's tax liability?

Answer: Calculation of the company's tax liability:

Taxable operating income	$100,000
Taxable interest income	5,000
Taxable dividend income (0.3 × $10,000)	3,000
Total taxable income	$108,000

Tax = $22,250 + ($108,000 - $100,000)0.39 = $25,370.

taxable dividend income = dividends - exclusion
= $10,000 - 0.7($10,000)
= $3,000**.**

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j.	**Assume that you are in the 25 percent marginal tax bracket and that you have $5,000 to invest. You have narrowed your investment choices down to California bonds with a yield of 7 percent or equally risky ExxonMobil bonds with a yield of 10 percent. Which one should you choose and why? At what marginal tax rate would you be indifferent to the choice between California and ExxonMobil bonds?**

Answer: After-tax return income at t = 25%:

ExxonMobil = 0.10($5,000) - (0.10)($5,000)(0.25) = $375.

California = 0.07($5,000) - $0 = $350.

Alternatively, calculate after-tax yields:

A-T $\text{yield}_{\text{ExxonMobil}}$ = 10.0%(1 - t) = 10%(1 - 0.25) = 7.5%.

A-T $\text{yield}_{\text{Calif.}}$ = 7.0%.

At what marginal tax rate would you be indifferent?

7.0% = 10.0%(1 - t). Solve for t.

$$\begin{aligned} 7.0\% &= 10.0\% - 10.0\%(t) \\ 10.0\%(t) &= 3\% \\ t &= 30\%. \end{aligned}$$

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Chapter 2

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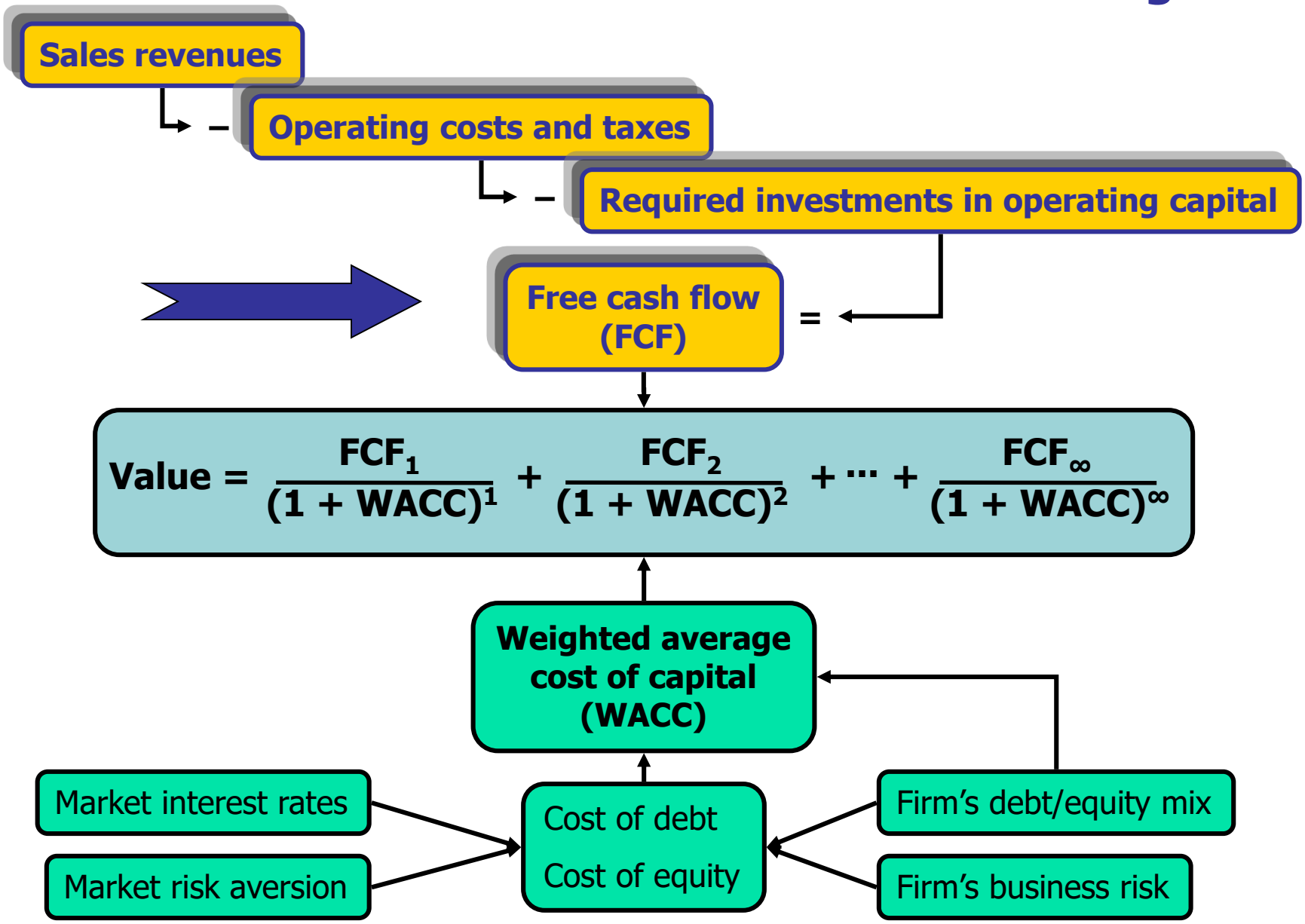
Topics in Chapter

- Income statement
- Balance sheet
- Statement of cash flows
- Free cash flow
- Performance measures
- Corporate taxes
- Personal taxes

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Determinants of Intrinsic Value: Calculating FCF



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Income Statement

	2015	2016
Sales	$3,432,000	$5,834,400
COGS	2,864,000	4,980,000
Other expenses	340,000	720,000
Deprec.	18,900	116,960
Tot. op. costs	3,222,900	5,816,960
EBIT	209,100	17,440
Int. expense	62,500	176,000
Pre-tax earnings	146,600	(158,560)
Taxes (40%)	58,640	(63,424)
Net income	$ 87,960	($ 95,136)

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What happened to sales and net income?

- Sales increased by over $2.4 million.
- Costs shot up by more than sales.
- Net income was negative.
- However, the firm received a tax refund since it paid taxes of more than $63,424 during the past two years.

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Balance Sheet: Assets

	2015	2016
Cash	$ 9,000	$ 7,282
S-T invest.	48,600	20,000
AR	351,200	632,160
Inventories	715,200	1,287,360
Total CA	1,124,000	1,946,802
Gross FA	491,000	1,202,950
Less: Depr.	146,200	263,160
Net FA	344,800	939,790
Total assets	$1,468,800	$2,886,592

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Effect of Expansion on Assets

- Net fixed assets almost tripled in size.
- AR and inventory almost doubled.
- Cash and short-term investments fell.

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Balance Sheet: Liabilities & Equity

	2015	2016
Accts. payable	$ 145,600	$ 324,000
Notes payable	200,000	720,000
Accruals	136,000	284,960
Total CL	481,600	1,328,960
Long-term debt	323,432	1,000,000
Common stock	460,000	460,000
Ret. earnings	203,768	97,632
Total equity	663,768	557,632
Total L&E	$1,468,800	$2,886,592

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What effect did the expansion have on liabilities & equity?

- CL increased as creditors and suppliers "financed" part of the expansion.
- Long-term debt increased to help finance the expansion.
- The company didn't issue any stock.
- Retained earnings fell, due to the year's negative net income and dividend payment.

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Statement of Cash Flows: 2016

Operating Activities	
Net Income	($ 95,136)
Adjustments:	
Depreciation	116,960
Change in AR	(280,960)
Change in inventories	(572,160)
Change in AP	178,400
Change in accruals	148,960
Net cash provided (used) by ops.	($503,936)

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Statement of Cash Flows: 2016

Investing Activities

Cash used to acquire FA	($711,950)
Change in S-T invest.	28,600
Net cash prov. (used) by inv. act.	($683,350)

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Statement of Cash Flows: 2016

Financing Activities

Change in notes payable	$ 520,000
Change in long-term debt	676,568
Payment of cash dividends	(11,000)
Net cash provided (used) by fin. act.	$1,185,568

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Summary of Statement of CF

Net cash provided (used) by ops.	($ 503,936)
Net cash to acquire FA	(683,350)
Net cash prov. (used) by fin. act.	1,185,568
Net change in cash	(1,718)
Cash at beginning of year	9,000
Cash at end of year	$ 7,282

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What can you conclude from the statement of cash flows?

- Net CF from operations = -$503,936, because of negative net income and increases in working capital.
- The firm spent $711,950 on FA.
- The firm borrowed heavily and sold some short-term investments to meet its cash requirements.
- Even after borrowing, the cash account fell by $1,718.

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What is free cash flow (FCF)? Why is it important?

- FCF is the amount of cash available from operations for distribution to all investors (including stockholders and debtholders) after making the necessary investments to support operations.
- A company's value depends on the amount of FCF it can generate.

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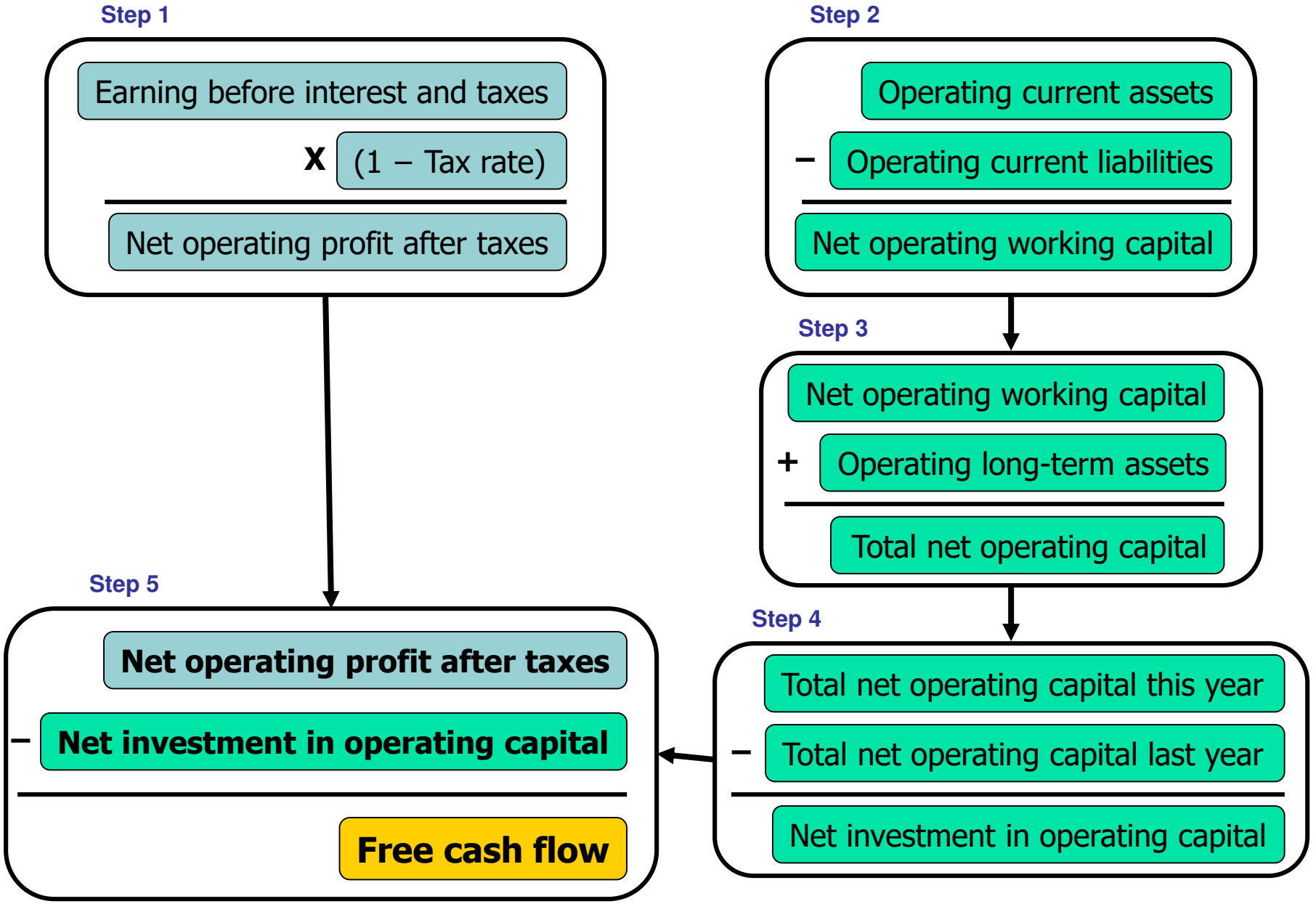
What are the five uses of FCF?

1. Pay interest on debt.
2. Pay back principal on debt.
3. Pay dividends.
4. Buy back stock.
5. Buy nonoperating assets (e.g., marketable securities, investments in other companies, etc.)

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Calculating Free Cash Flow in 5 Easy Steps



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Net Operating Profit after Taxes (NOPAT)

$$NOPAT = EBIT(1 - Tax\ rate)$$

$$NOPAT_{16} = \$17,440(1 - 0.4)$$
$$= \$10,464.$$

$$NOPAT_{15} = \$125,460.$$

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What are operating current assets?

- Operating current assets are the CA needed to support operations.
  - Op CA include: cash, inventory, receivables.
  - Op CA exclude: short-term investments, because these are not a part of operations.

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What are operating current liabilities?

- Operating current liabilities are the CL resulting as a normal part of operations.
  - Op CL include: accounts payable and accruals.
  - Op CL exclude: notes payable, because this is a source of financing, not a part of operations.

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Net Operating Working Capital (NOWC)

$$NOWC = \text{Operating CA} - \text{Operating CL}$$

$$NOWC_{16} = (\$7{,}282 + \$632{,}160 + \$1{,}287{,}360) - (\$324{,}000 + \$284{,}960)$$

$$= \$1{,}317{,}842.$$

$$NOWC_{15} = \$793{,}800.$$

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Total net operating capital (also called operating capital)

- Operating Capital= NOWC + Net fixed assets.
- Operating Capital 2015
  = $1,317,842 + $939,790
  = $2,257,632.
- Operating Capital 2014 = $1,138,600.

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Free Cash Flow (FCF) for 2015

FCF = NOPAT - Net investment in operating capital

= $10,464 - ($2,257,632 - $1,138,600)

= $10,464 - $1,119,032

= -$1,108,568.

How do you suppose investors reacted?

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Uses of FCF

After-tax interest payment =	$105,600
Reduction (increase) in debt =	−$1,196,568
Payment of dividends =	$11,000
Repurchase (Issue) stock =	$0
Purch. (Sale) of ST investments =	−$28,600
Total uses of FCF =	−$1,108,568

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Operating Profitability (OP) Ratio

OP = NOPAT / Sales

OP_{16} = \$10,464 / \$5,834,400= 0.18%.

OP_{15} = 2.15%.

Operating profitability (the amount of operating profit generated by a dollar of sales) fell.

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Capital Requirement (CR) Ratio

CR = Total operating capital / Sales

CR_{16} = \$2,257,632 / \$5,834,400= 38.7%.

CR_{15} = 19.5%.

Capital requirements (the amount of operating capital required to generate a dollar of sales) went up, which means capital utilization worsened.

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Return on Invested Capital (ROIC)

ROIC = NOPAT / Total operating capital

$ROIC_{16}$ = \$10,464 / \$2,257,632 = 0.5%.

$ROIC_{15}$ = 11.0%.

ROIC fell due to a decline in operating profitability and an increase in the operating capital required to generate a dollar of sales.

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The firm's cost of capital is 10%. Did the growth add value?

- No. The ROIC of 0.5% is less than the WACC of 10%. Investors did not get the return they require.
- Note: High growth usually causes negative FCF (due to investment in capital), but that's ok if ROIC > WACC. For example, in 2008 Qualcomm had high growth, negative FCF, but a high ROIC.

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Economic Value Added (EVA)

- WACC is weighted average cost of capital
- EVA = NOPAT- (WACC)(Capital)

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Economic Value Added (WACC = 10% for both years)

$$
\begin{aligned}
EVA &= NOPAT - (WACC)(Capital) \\
EVA_{16} &= \$10{,}464 - (0.1)(\$2{,}257{,}632) \\
&= \$10{,}464 - \$225{,}763 \\
&= -\$215{,}299. \\
EVA_{15} &= \$125{,}460 - (0.10)(\$1{,}138{,}600) \\
&= \$125{,}460 - \$113{,}860 \\
&= \$11{,}600.
\end{aligned}
$$

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Stock Price and Other Data

	2015	2016
Stock price	$8.50	$6.00
# of shares	100,000	100,000
EPS	$0.88	-$0.95
DPS	$0.22	$0.11

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Market Value Added (MVA)

- MVA = Market Value of the Firm - Book Value of the Firm
- Market Value = (# shares of stock)(price per share) + Value of debt
- Book Value = Total common equity + Value of debt

(More…)

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MVA (Continued)

- If the market value of debt is close to the book value of debt, then MVA is:

- MVA = Market value of equity – book value of equity

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2015 MVA (Assume market value of debt = book value of debt.)

- Market Value of Equity 2015:
  - (100,000)($6.00) = $600,000.
- Book Value of Equity 2016:
  - $557,632.
- MVA_{16} = $600,000 - $557,632 = $42,368.
- MVA_{15} = $850,000 - $663,768 = $186,232.

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Key Features of the Tax Code

- Corporate Taxes
- Individual Taxes

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2007-2015 Corporate Tax Rates

Taxable Income	Tax on Base	Rate on amount above base
0 -50,000	0	15%
50,000 - 75,000	7,500	25%
75,000 - 100,000	13,750	34%
100,000 - 335,000	22,250	39%
335,000 - 10M	113,900	34%
10M - 15M	3,400,000	35%
15M - 18.3M	5,150,000	38%
18.3M and up	6,416,667	35%

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Features of Corporate Taxation

- Progressive rate up until $18.3 million taxable income.
  - Below $18.3 million, the marginal rate is not equal to the average rate.
  - Above $18.3 million, the marginal rate and the average rate are 35%.

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Features of Corporate Taxes (Cont.)

- A corporation can:
  - deduct its interest expenses but not its dividend payments;
  - carry back losses for two years, carry forward losses for 20 years.
  - exclude 70% of dividend income if it owns less than 20% of the company's stock

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Example

- Assume a corporation has $100,000 of taxable income from operations, $5,000 of interest income, and $10,000 of dividend income.
- What is its tax liability?

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Example (Continued)

Operating income	$100,000
Interest income	5,000
Taxable dividend income	3,000*
Taxable income	$108,000

*Dividends - Exclusion
= $10,000 - 0.7($10,000) = $3,000.

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Example (Continued)

Taxable Income = $108,000
Tax on base = $22,250
Amount over base = $108,000 - $100,000
= $8,000
Tax = $22,250 + 0.39 ($8,000)
= $25,370.

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Key Features of Individual Taxation

- Individuals face progressive tax rates, from 10% to 39.6%.
- The rate on long-term (i.e., more than one year) capital gains is 15%. But capital gains are only taxed if you sell the asset.
- Dividends are taxed at the same rate as capital gains.
- Interest on municipal (i.e., state and local government) bonds is not subject to Federal taxation.

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Taxable versus Tax Exempt Bonds

- State and local government bonds (municipals, or "munis") are generally exempt from federal taxes.

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ExxonMobil bonds at 10% versus California muni bonds at 7%

- T = Tax rate = 25.0%.
- After-tax interest income:
- ExxonMobil = 0.10($5,000) - 0.10($5,000)(0.25)
- ExxonMobil = 0.10($5,000)(0.75) = $375.
- CAL = 0.07($5,000) - 0 = $350.

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Breakeven Tax Rate

- At what tax rate would you be indifferent between the muni and the corporate bonds?
- Solve for T in this equation:

$$\text{Muni yield} = \text{Corp Yield}(1-T)$$

$$7.00\% = 10.0\%(1-T)$$

$$T = 30.0\%.$$

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Implications

- If T > 30%, buy tax exempt munis.
- If T < 30%, buy corporate bonds.
- Only high income, and hence high tax bracket, individuals should buy munis.

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