FINC311: Principles of Finance

Chapter 3

Working with Financial Statements

Objectives for Today

- Why evaluate financial statements?
- Learn how to standardize financial statements for comparison purposes
- How to compute and interpret important financial ratios
  - Liquidity ratios

Why Evaluate Financial Statements?

External Uses

- Creditors
- Stockholders
- Suppliers
- Customers

Internal Uses

- Planning for the future (e.g., budgeting and forecasting)
- Basis for new investment decisions
- Performance evaluation

Role of Financial Statements

- Best information available about a company
  - Serve as the company report card
  - Provide actual results
- Basis for analyzing a company
  - Is company healthy?
  - Growth trends
  - Opportunities to improve profits and cash flow

Financial Statements vs. Analysis

Financial Statements	
Financial "facts"	Foundation for analysis

Financial Analysis	
Interpretation	Insights

Standardized Financial Statements

- Makes it easier to compare companies
  - Different sizes
  - Different currencies
  - Different time periods
- Common-size statements
  - Balance sheet: items as a % of assets
  - Income statement: items as a % of revenue

Sales	$750	100%
Cost of Goods Sold	($500)	66.7%
Gross Margin	$250	33.3%
SGA Expense	($100)	13.3%
Depreciation	($15)	2%
Earnings before interest and taxes	$135	18%
Interest paid	($5)	0.7%
Taxable income	$130	17.3%
Taxes	($46)	6.1%
Net Income	$84	11.2%

Note: Amounts in thousands.

Common Size Income Statements

2015 Fiscal Year	Apple	Samsung
Revenue	100.0%	100.0%
Cost of Revenue	-59.9%	-61.5%
Gross Margin	40.1%	38.5%
Research & Development	-3.5%	0.0%
SGA	-6.1%	-25.3%
Operating Income	30.5%	13.2%
Other	0.5%	-0.2%
Income before income taxes	31.0%	12.9%
Income tax expense	-8.2%	-3.4%
Net Income	**22.8%**	**9.5%**

Common Size Balance Sheets

Assets	Apple As of 9/25/15	Samsung As of 12/31/15
Cash	7.3%	9.3%
Short-Term Securities	7.1%	18.3%
Accounts Receivable	5.8%	10.4%
Inventories	0.8%	7.8%
Other Current Assets	9.8%	5.8%
Current Assets	30.8%	51.5%
Long-Term Securities	56.5%	3.4%
Property, Plant & Equipment, net	7.7%	35.7%
Other Assets	5.0%	9.3%
Total Assets	**100%**	**100%**

Liabilities & Equity	Apple As of 9/25/15	Samsung As of 12/31/15
Account Payable	12.2%	2.6%
Short-Term Borrowings	3.8%	4.6%
Accrued Expenses	8.7%	4.8%
Other Current Liabilities	3.1%	5.1%
Current Liabilities	27.8%	17.1%
Non-Current Liabilities	31.2%	9.0%
Total Liabiities	**58.9%**	**26.1%**
Preferred & Common Stock	9.4%	2.2%
Retained Earnings	31.8%	76.4%
Other Components of Equity	-0.1%	-4.6%
Total Equity	**41.1%**	**74.1%**
Total Liabilities & Equity	**100%**	**100%**

Question

A firm has inventory of $46,500, accounts payable of $17,400, cash of $1,250, net fixed assets of $318,650, long-term debt of $109,500, and accounts receivable of $16,600. What is the common-size percentage of the equity?

A. 70.60 percent

B. 70.12 percent

C. 66.87 percent

D. 42.08 percent

E. 68.75 percent

Answer

$$\text{Common size percentage of the equity} = \frac{\text{Equity}}{\text{Total Assets}}$$

Total Assets = Cash + A/R + Inventory + Net Fixed Assets
= \$1,250 + \$16,600 + \$46,500 + \$318,650
= \$383,000

Equity = Total Assets – A/P – Long-term Debt
= \$383,000 – \$17,400 – \$109,500
= \$256,100

$$\text{Common size percentage of the equity} = \frac{\text{Equity}}{\text{Total Assets}} = \frac{\$256{,}100}{\$383{,}000} = \boxed{66.87\%}$$

Categories of Financial Ratios

Liquidity Ratios

Financial Leverage Ratios

Profitability Ratios

Asset Management Ratios

Market Value Ratios

Ratio Analysis

- For each ratio, ask yourself:

What is the ratio trying to measure?

+

Why is that information important?

Ratio Analysis

- Then make sure you know how to calculate it

Um…can I phone a friend?

I knew I should have paid more attention in Rich's class.

I hope one of you knows 'cause I sure as heck don't.

What are you trying to tell me with this ratio? What is the numerator and what is the denominator?

Liquidity Ratios

Liquidity

- A liquid asset is an asset that can be converted to cash quickly without losing value

More Liquid → Less Liquid

Question

A firm's liquidity level decreases when:

A. Inventory is purchased with cash.
B. Inventory is sold on credit.
C. Inventory is sold for cash.
D. An account receivable is collected.
E. Proceeds from a long-term loan are received.

Liquidity Ratios

- Liquidity ratios are also known as short-term solvency ratios

What are these ratios trying to measure? → The level of liquidity a firm has

Why is this information important? → It indicates whether or not the firm can pay its bills over the short term

Liquidity Ratios

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Quick Ratio*} = \frac{(\text{Current Assets} - \text{Inventory})}{\text{Current Liabilities}}$$

$$\text{Cash Ratio} = \frac{\text{Cash}}{\text{Current Liabilities}}$$

* Also called “Acid-Test” ratio

Liquidity Ratios

PRUFROCK Balance Sheet - 2016					
ASSETS			Liabilities & Owners Equity		
Current Assets			Current Liabilities		
Cash	$	98	Accounts Payable	$	344
Accounts Receivable	$	188	Notes Payable	$	196
Inventory	$	422	Total	$	540
Total	$	708	Long term debt	$	457
			Owners' Equity		
			Common Stock and paid in surplus	$	550
Fixed Assets			Retained Earnings	$	2,041
Net Plant & Equipment	$	2,880	Total	$	2,591
Total Asets	$	3,588	Total Liabilties & Owners' Equity	$	3,588

2016 Liquidity Ratios for Prufrock

Current Ratio = CA/CL = $708/$540 = 1.31 times

Quick Ratio = (CA–Inventory)/CL = ($708–$422)/$540 = .53 times

Cash Ratio = Cash/CL = $98/$540 = .18 times

Question

Motor Works has total assets of $919,200, long-term debt of $264,500, total equity of $466,900, net fixed assets of $682,800, and sales of $1,021,500. The profit margin is 6.2 percent. What is the current ratio?

A. .79

B. .84

C. 1.01

D. 1.26

E. 1.19

Answer

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Assets = Total Assets – Net Fixed Assets
= \$919,200 – \$682,800
= \$236,400

Current Liabilities = Total Assets – Total Equity – LTD
= \$919,200 – \$466,900 – \$264,500
= \$187,800

$$\text{Current Ratio} = \frac{\$236{,}400}{\$187{,}800} = \boxed{1.26}$$

Question

City Plumbing has inventory of $287,800, equity of $538,800, total assets of $998,700, and sales of $1,027,400. What is the common-size percentage for the inventory account?

A. 28.01 percent
B. 33.66 percent
C. 53.42 percent
D. 28.82 percent
E. 31.68 percent

Question

Which one of these transactions will increase the liquidity of a firm?

A. Cash purchase of new production equipment
B. Payment of an account payable.
C. Cash purchase of inventory
D. Credit sale of inventory at cost.
E. Cash payment of employee wages

Financial Leverage Ratios

Financial Leverage

- Financial leverage refers to the use of debt to finance an asset
  - It increases the potential return (or loss) on an investment
  - A firm with a significant amount of debt relative to its equity is considered to be "highly leveraged"
- Let's look at the home of Mr. Joe Rich to illustrate an example

Understanding Leverage

	Buy House w/Debt	Buy House w/o Debt
Purchase price of home	$1,000,000	$1,000,000
Amount paid by debt	$800,000	---
Amount paid by cash	$200,000	$1,000,000
Gain Scenario		
Net selling price of home in 5 years	$1,300,000	$1,300,000
Gain on sale	$300,000	$300,000
Initial cash investment	$200,000	$1,000,000
Total return on investment – Gain	+ 150%	+ 30%
Loss Scenario		
Net selling price of home in 5 years	$900,000	$900,000
Loss on sale	($100,000)	($100,000)
Initial cash investment	$200,000	$1,000,000
Total return on investment – Loss	– 50%	– 10%

Understanding Leverage

	Buy House w/Debt	Buy House w/o Debt
Purchase price of home	$1,000,000	$1,000,000
Amount paid by debt	$800,000	---
Amount paid by cash	$200,000	$1,000,000

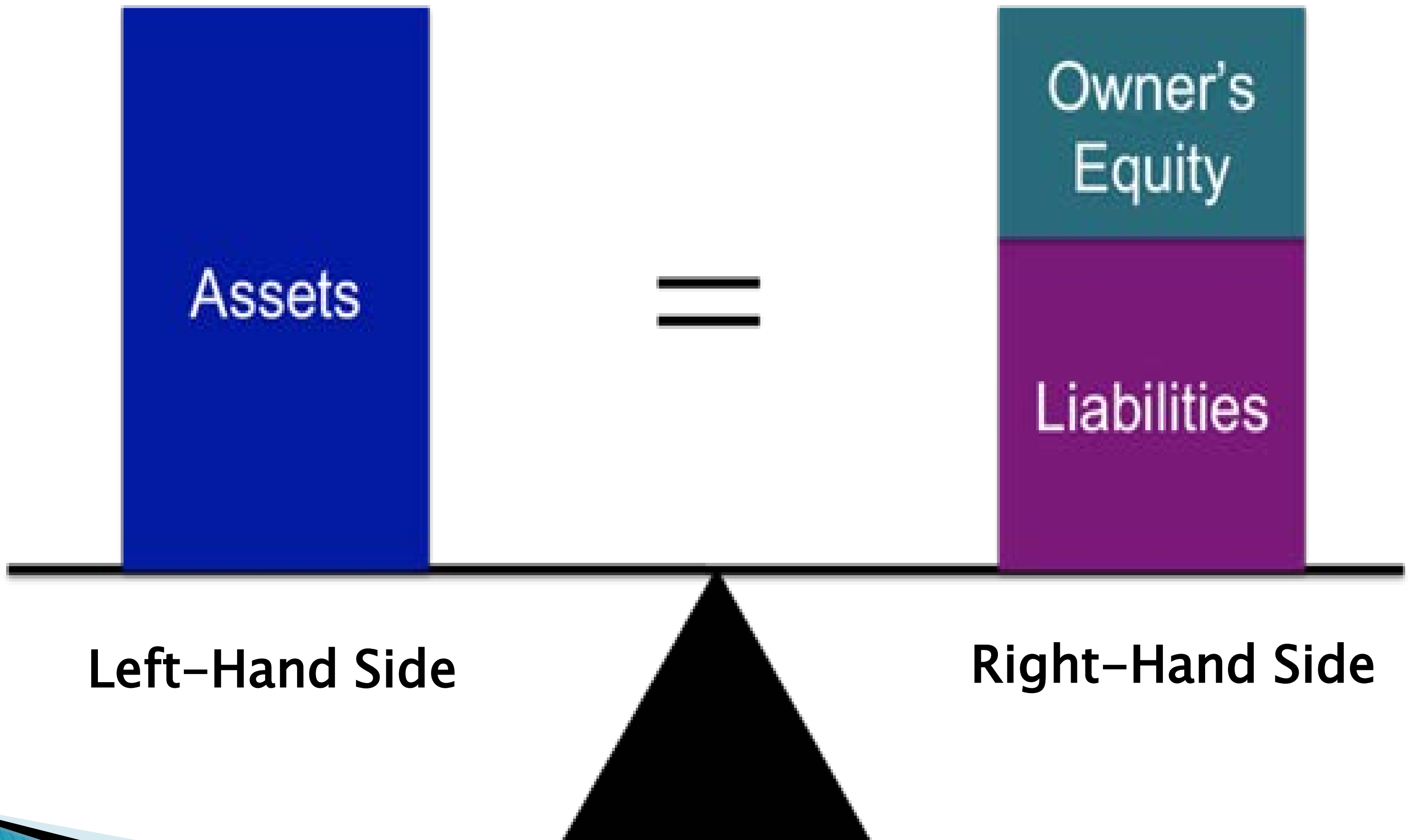
What's the issue if the house sells for $700,000?

Big Loss Scenario

Net selling price of home in 5 years	$700,000	$700,000
Loss on sale	($300,000)	($300,000)
Initial cash investment	$200,000	$1,000,000
Total return on investment – Loss	– 150%	– 30%

Could go bankrupt!

Balance Sheet Equation



Financial Leverage Ratios

- Financial leverage ratios are also known as long-term solvency ratios

What are these ratios trying to measure?	The level of a firm's indebtedness and their ability to service debt
Why is this information important?	It indicates whether or not the firm can meet its obligations over the long-term

Financial Leverage Ratios

$$\text{Total Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

$$\text{Debt-to-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

$$\text{Equity Multiplier} = \frac{\text{Total Assets}}{\text{Total Equity}} = 1 + \frac{\text{Total Debt}}{\text{Total Equity}}$$

Equity Multiplier Detail

$$\text{Equity Multiplier} = \frac{\text{Total Assets}}{\text{Total Equity}}$$

$$\text{Total Assets} = \text{Total Debt} + \text{Total Equity}$$

$$\text{Equity Multiplier} = \frac{\text{Total Debt} + \text{Total Equity}}{\text{Total Equity}}$$

$$= \frac{\text{Total Debt}}{\text{Total Equity}} + \frac{\text{Total Equity}}{\text{Total Equity}}$$

$$= \frac{\text{Total Debt}}{\text{Total Equity}} + 1$$

Financial Leverage Ratios

$$\text{Times Interest Earned} = \frac{\text{EBIT}}{\text{Interest}}$$

$$\text{Cash Coverage} = \frac{(\text{EBIT} + \text{Depreciation})}{\text{Interest}}$$

* EBIT = Earnings Before Interest & Taxes

Financial Leverage Ratios

PRUFROCK Balance Sheet - 2016				
ASSETS			Liabilities & Owners Equity	
Current Assets			Current Liabilities	
Cash	$	98	Accounts Payable	$ 344
Accounts Receivable	$	188	Notes Payable	$ 196
Inventory	$	422	Total	$ 540
Total	$	708	Long term debt	$ 457
			Owners' Equity	
			Common Stock and paid in surplus	$ 550
Fixed Assets			Retained Earnings	$ 2,041
Net Plant & Equipment	$	2,880	Total	$ 2,591
Total Asets	$	3,588	Total Liabilties & Owners' Equity	$ 3,588

2016 Financial Leverage Ratios for Prufrock

Total Debt Ratio = TD/TA = ($540+457)/$3,588 = .28 times

Debt to Equity Ratio = TD/TE = ($540+$457)/$2,591 = .38 times

Equity Multiplier = TA/TE = $3,588/$2,591 = 1.38 times

= 1 +TD/TE = 1+.38 = 1.38 times

Financial Leverage Ratios

PRUFROCK Income Statement - 2016		
Sales	$	2,311
COGS	$	1,344
Depreciation	$	276
EBIT	$	691
Interest	$	141
Taxable Income	$	550
Taxes	$	187
Net Income	$	363
Dividends	$	121
Addition to RE	$	242

2016 Financial Leverage Ratios for Prufrock

Times Interest Earned = EBIT/Interest = \$691/\$141 = 4.9 times

Cash Coverage = (EBIT+Depreciation)/Interest = (\$691+\$276)/\$141
= 6.9 times

Question

You would like to borrow money three years from now to build a new building. In preparation for applying for that loan, you are in the process of developing target ratios for your firm. Which set of ratios represents the best target mix considering that you want to obtain outside financing in the relatively near future:

A. Times interest earned = 1.7; debt-equity ratio = 1.6

B. Times interest earned = 1.5; debt-equity ratio = 1.2

C. Cash coverage ratio = .8; debt-equity ratio = .8

D. Cash coverage ratio = 2.6; debt-equity ratio = .3

E. Cash coverage ratio = .5; debt-equity ratio = .2

Question

Financial leverage:

A. Increases as the net working capital increases.
B. Is equal to the market value of a firm divided by the firm's book value.
C. Is inversely related to the level of debt.
D. Is the ratio of a firm's revenues to its fixed expenses.
E. Increases the potential return to the stockholders.

Profitability Ratios

Profitability Ratios

- Profitability ratios tend to be the most widely used of all the financial ratios

What are these ratios trying to measure? → A firm's profitability in relation to sales, assets, and equity

Why is this information important? → It shows how efficiently the firm uses its assets and manages its operations

Profitability Ratios

$$\text{Profit Margin} = \frac{\text{Net Income}}{\text{Sales}}$$

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Total Equity}}$$

Profitability Ratios

Ratio	Formula		SAMSUNG
Profit Margin	Net Income/Sales	**21.3%** =\$45.7/\$214.2	**11.1%** =\$19.9/\$179.7
Return on Assets	Net Income/Total Assets	**14.2%** =\$45.7/\$321.7	**8.5%** =\$19.9/\$233.3
Return on Equity	Net Income/Total Equity	**35.6%** =\$45.7/\$128.2	**11.6%** =\$19.9/\$171.7

Fiscal Year 2016;
Assume .00089 South Korean Won = \$1
Source: quotes.wsj.com

Importance of Return on Equity

Company A	Company B
Net Income = $10 million	Net Income = $10 million
Shareholders' Equity = $100 million	Shareholders' Equity = $50 million
ROE = 10%	ROE = 20%

Question

Sunshine Rentals has a debt-equity ratio of .67. The return on assets is 8.1 percent, and total equity is $595,000. What is the net income?

A. $82,147.09

B. $81,311.29

C. $80,485.65

D. $78,887.02

E. $83,013.69

Question

Assume the Following:

$$\frac{\text{Debt}}{\text{Equity}} = .67$$

$$\frac{\text{Net Income}}{\text{Total Assets}} = .081$$

Equity = $595,000

Assets = Debt + Equity

What is the net income?

A. $82,147.09

B. $81,311.29

C. $80,485.65

D. $78,887.02

E. $83,013.69

Question

Bed Bug Inn has annual sales of $137,000. Earnings before interest and taxes is equal to 5.8 percent of sales. For the period, the firm paid $4,700 in interest. What is the profit margin if the tax rate is 34 percent?

A. –2.43 percent

B. 1.56 percent

C. 3.33 percent

D. –5.29 percent

E. –6.11 percent

Question

Goshen Industrial Sales has sales of $487,600, total equity of $367,700, a profit margin of 5.1 percent, and a debt-equity ratio of .34. What is the return on assets?

A. 5.89 percent
B. 5.05 percent
C. 6.76 percent
D. 8.80 percent
E. 7.33 percent

Asset Management Ratios

Asset Management Ratios

- Asset management ratios are also called asset utilization (or turnover) ratios
  - They are intended to describe how effectively a firm uses its assets to generate sales

Inventory Ratios

Receivables Ratios

Total Asset Ratios

Inventory Ratios

What are these ratios trying to measure?

How quickly inventory "turns over" (i.e., how long it is on the balance sheet)

Why is this information important?

It indicates whether or not inventory may be getting obsolete or potential stock-out issues

Inventory Ratios

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Inventory}}$$

$$\text{Days Sales in Inventory} = \frac{365}{\text{Inventory Turnover}}$$

Inventory Ratios

PRUFROCK Balance Sheet - 2016					
ASSETS			Liabilities & Owners Equity		
Current Assets			Current Liabilities		
Cash	$	98	Accounts Payable	$	344
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2016 Inventory Ratios for Prufrock

Inventory Turnover = COGS/Inventory = $1,344/$422 = 3.2 times

Days' Sales in Inventory = 365/Inventory Turnover = 365/3.2 = 114 days

Receivable Ratios

What are these ratios trying to measure?

How quickly credit sales are collected from customers

Why is this information important?

It indicates whether or not receivables are taking too long to collect and the potential for uncollectable accounts

Receivables Ratios

$$\text{Receivables Turnover} = \frac{\text{Sales}}{\text{Accounts Receivable}}$$

$$\text{Days Sales in Receivables} = \frac{365}{\text{Receivables Turnover}}$$

Receivables Ratios

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2016 Receivables Ratios for Prufrock

Receivables Turnover = Sales/AR = \$2,311/\$188 = 12.3 times

Days' Sales in Receivables = 365/Receivables Turnover = 365/12.3 = 30 days

Asset Turnover Ratio

What is this ratio trying to measure?

How much sales are generated for every $1 in assets

Why is this information important?

It provides the level of assets needed to generate sales (i.e., an indication of the capital intensity of the firm)

Asset Turnover Ratio

$$\text{Total Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets}}$$

Asset Turnover Ratio

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2016 Asset Turnover Ratio for Prufrock

Asset Turnover = Sales/TA = $2,311/$3,588 = 0.64 times

Question

Leisure Products has sales of $738,800, cost of goods sold of $598,200, and accounts receivable of $86,700. How long on average does it take the firm's customers to pay for their purchases? Assume a 365-day year.

A. 8.65 days

B. 11.28 days

C. 25.01 days

D. 42.83 days

E. 45.33 days

Question

Phil's Carvings sells its inventory in 93 days, on average. Costs of goods sold for the year are $187,200. What is the average value of the firm's inventory? Assume a 365-day year.

A. $20,129

B. $47,698

C. $57,132

D. $61,096

E. $32,513

Market Value Ratios

Market Value Ratios

- Market value ratios are based on the market price per share of stock, and thus are relevant only for publicly-traded companies

What are these ratios trying to measure? → The market value of the firm relative to its financial results

Why is this information important? → It indicates how the public equity markets value the firm

Market Value Ratios

$$\text{Price-Earnings Ratio} = \frac{\text{Price per Share}}{\text{Earnings per Share}}$$

$$\text{Price-Sales Ratio} = \frac{\text{Price per Share}}{\text{Sales per Share}}$$

P/E Comparisons

	Facebook	Twitter
Price per share	$172.96	$18.17
Price to earnings	39.40	--

	Southwest	United
Price per share	$53.95	$61.24
Price to earnings	16.55	8.46

	Chipotle	McD's
Price per share	$308.83	$156.33
Price to earnings	65.15	25.59

	Ford	Tesla
Price per share	$11.59	$362.75
Price to earnings	12.12	--

Source: quotes.wsj.com as of 9/12/17

Prufrock Financial Data

PRUFROCK Balance Sheet - 2016			
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- Market Price = $88 per share = PPS
- Shares outstanding = 33 million

Prufrock Market Value Measures

- **Earnings per Share** = EPS = \$363 / 33 = \$11
- **PE ratio** = PPS / EPS = \$88 / \$11 = 8 times
- **Price/Sales ratio** = PPS/Sales per share
  - \$88 / (\$2,311 / 33) = 1.26 times

Question

Dellf's has a profit margin of 3.8 percent on sales of $287,200. The firm currently has 5,000 shares of stock outstanding at a market price of $7.11 per share. What is the price-earnings ratio?

A. 3.26
B. 8.02
C. 11.50
D. 5.93
E. 12.84

Answer

$$\text{Price-Earnings Ratio} = \frac{\text{Price per Share}}{\text{Earnings per Share}}$$

$$\text{Earnings per Share} = \frac{\text{Net Income}}{\text{Shares Outstanding}}$$

$$\text{Price-Earnings Ratio} = \frac{\$7.11}{(.038*\$287{,}200)/5{,}000}$$

$$= \boxed{\$3.26}$$

DuPont Identity

The DuPont Company

- E.I. DuPont founded the DuPont Company in 1802 in Wilmington, DE and the company subsequently invented numerous common household items

Inventions

Nylon

Teflon

Lucite

Kevlar

Freon

Lycra

The DuPont invention that forever changed how things work in the corporate world

It was a DuPont explosives salesman by the name of Donaldson Brown who in 1912 submitted an internal efficiency report to his superiors that used a version of the return-on-investment formula—still known as the DuPont formula—that eventually came to be embedded as one of the defining statistical metrics in the corporate world.

The DuPont Identity

- The DuPont Identity (or DuPont Equation) breaks down ROE into three distinct areas which provide better insight into business results

Return on Equity = Profit Margin × Asset Use × Leverage

Profit Margin
- Measures the firm's operating efficiency
- How well does it control cost

Asset Use
- Measures the firm's efficient use of assets
- How well does it manage its assets

Leverage
- Measures the firm's financial leverage

The DuPont Identity

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Total Equity}}$$

same thing

$$\text{Return on Equity} = \underbrace{\left[\frac{\text{Net Income}}{\cancel{\text{Sales}}}\right]}_{\text{Profit Margin}} \times \underbrace{\left[\frac{\cancel{\text{Sales}}}{\cancel{\text{Total Assets}}}\right]}_{\text{Asset Turnover}} \times \underbrace{\left[\frac{\cancel{\text{Total Assets}}}{\text{Total Equity}}\right]}_{\text{Equity Multiplier}}$$

Prufrock Financial Data

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Current Assets			**Current Liabilities**		
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COGS	$	1,344
Depreciation	$	276
EBIT	$	691
Interest	$	141
Taxable Income	$	550
Taxes	$	187
Net Income	$	363
Dividends	$	121
Addition to RE	$	242

ROE = Net Income / Equity

= $363 / $2,591

= 14%

Prufrock's DuPont Identity

PRUFROCK RECAP			
Liquidity Ratios		**Financial Leverage Ratios**	
Current Ratio	1.31	Total Debt Ratio	0.28
Quick Ratio	0.53	Debt to Equity	0.38
Cash Ratio	0.18	Equity Multiplier	1.38
Asset Management Ratios		Times Interest Earned	4.9
Inventory Turnover	3.20	Cash Coverage	6.9
Days' Sales in Inventory	114	**Profitability Measures**	
Receivables Turnover	12.30	Profit Margin	15.70%
Days' Sales in Receivables	30	ROA	10.10%
Total Asset Turnover	0.64	ROE	14.00%
Capital Intensity Ratio			
Market Value Measures			
Market Price	$88.00		
Shares Outstanding	33 m		
EPS	$11.00	Price/Sales Ratio	1.26
PE Ratio	8.0	Book value per share	$78.52
Market to Book	1.12	EBITDA Ratio	3.93

ROE = Profit Margin * Total Asset Turnover * Equity Multiplier

= 0.157 * 0.64 * 1.38 = 14%

PM = Net Income/Sales = 15.7%

TAT = Sales/Total Assets = .64 times

EM = Total Assets/Total Equity = 1.38

Question

Assume the Following:

$$\frac{\text{Net Income}}{\text{Sales}} = .0379$$

$$\frac{\text{Total Assets}}{\text{Total Equity}} = 1.68$$

$$\frac{\text{Sales}}{\text{Total Assets}} = .97$$

Equity = $318,456

What is the amount of the firm's sales?

A. $518,956
B. $473,550
C. $195,420
D. $190,839
E. $639,440

Benchmarking

- Ratios need to be compared to something
- Time-Trend Analysis
  - How the firm's performance is changing through time
  - Internal and external uses
- Peer Group Analysis
  - Compare to similar companies or within industries

Problems with Financial Analysis

- Conglomerates
  - No readily available comparables
- Global competitors
- Different accounting procedures
- Different fiscal year ends
- Differences in capital structure
- Seasonal variations and one-time events

Some Warnings

- Net Income in 2000 of $1.3 billion
- Bankruptcy filing 11 months later

- Net Income in 2007 of $4.2 billion
- Bankruptcy filing 9 months later

Flying an Airplane – w/Metrics

Flying an Airplane – Blind!