Financial Accounting
Recitation 6 (FSA)

MIT Sloan School of Management

Finance at MIT
Where ingenuity drives results

Agenda

Financial Statement Analysis and Ratios

- Liquidity & Solvency Ratios
- Profitability Ratios
- Efficiency Ratios
- Dupont Analysis

Consider Three Kinds of Ratios

Liquidity and Solvency Ratios:

- Does the company have the ability to pay its bills?

Profitability Ratios:

- How well is the company generating profits?

“Efficiency” Ratios:

- Is company led efficiently?

Solvency and Liquidity Ratios

Liquidity/Solvency:

$$Leverage = \frac{Total\ Liabilities}{Total\ Shareholders'Equity}$$

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

Profitability Ratios

Margins:

$$Net\ Margin\ (\%) = \frac{Net\ Income}{Revenue}$$

$$Gross\ Margin\ (\%) = \frac{Revenue\ -COGS}{Revenue}$$

Return on Investment:

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

$$ROE = \frac{Net\ Income}{Shareholders' Equity}$$

Operating Efficiency

$$A/R\ Turnover = \frac{Revenue}{Net\ Accounts\ Receivable}$$

- High credit sales but low A/R balance would imply that you've collected cash on your credit revenues quickly

$$Inventory\ Turnover = \frac{COGS}{Inventory}$$

- High COGS (expense when we sell the product) and low inventory would imply that you turn your inventory around quickly

$$Days\ Receivable\ = \frac{365}{A/R\ Turnover}$$

- Measures the average number of days that the receivable is outstanding before it is collected

Changes in Ratios

Type	Before	Add/Subtract for *both* numerator and denominator	After	Change
Ratio > 1	$\frac{3}{2}$	$\frac{3+1}{2+1}$	$\frac{4}{3}$	Decrease $(\frac{3}{2} > \frac{4}{3})$
Ratio > 1	$\frac{3}{2}$	$\frac{3-1}{2-1}$	2	Increase $(\frac{3}{2} < 2)$
Ratio < 1	$\frac{1}{2}$	$\frac{1+1}{2+1}$	$\frac{2}{3}$	Increase $(\frac{1}{2} < \frac{2}{3})$
Ratio < 1	$\frac{1}{2}$	$\frac{1-1}{2-1}$	0	Decrease $(\frac{1}{2} > 0)$

- Check what your initial ratio is (above or below 1?)
- Check whether your transaction will affect the denominator, numerator, both, or none!

Solvency/Liquidity

(in millions USD)	Walmart	Sears
Abbreviated balance sheet	2003	2003
Cash	2,758	9,057
Accounts Receivables (net)	2,108	1,956
Inventory	24,891	5,335
Current assets	30,483	18,196
Total assets	**94,685**	**27,723**
Current liabilities	32,617	13,759
Total liabilities	55,348	21,322
Total shareholders' equity	39,337	6,401
Total liabilities + SE	**94,685**	**27,723**

Walmart Current Ratio = Current Assets / Current Liabilities
= 30,483 / 32,617 = 0.93

Sears Current Ratio = 18,196 / 13,159 = 1.32

Walmart Leverage ratio = Total Liabilities / Total S/E
= 55,348 / 39,337 = 1.41

Sears Leverage ratio = 21,322 / 6,401 = 3.33

Sears' D/E Ratio

Sears Debt-Equity ratio = Total Liabilities / Total S/E
= 3.33

In 2003, how would Sears' Debt/Equity ratio change if:

- Sears pays more dividends in 2003
  - D/E would increase
- Sears writes off more receivables in 2003
  - D/E would not change
- Sears issues $1bn of long-term debt in 2003
  - D/E would increase
- Sears issues $1bn of long-term debt and $1 bn of stock in 2003
  - D/E would decrease

Profitability

(in millions USD)	Walmart	Sears
Abbreviated income statement	2003	2003
Revenue	246,525	41,124
COGS	191,838	26,231
Net income	8,039	3,397

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Total liabilities + SE	**94,685**	**27,723**

Walmart Net Margin = Net Income / Revenues
= 8,039 / 246,565 = 3.26%

Sears Net Margin = 3,397 / 41,124 = 8.26%

Walmart ROE = Net Income / Ending Total SE
= 8,039 / 39,337 = 20.43%

Sears ROE = 3,397 / 6,401 = 53.07%

Walmart's ROE

Walmart ROE **=** Net Income / Ending Total SE
= 8,039 / 39,337 = 20.43%

In 2003, how would Walmart's ROE change if:

- On 12/31/2003, Walmart paid a dividend
  - ROE would increase

- On 12/31/2003, Walmart wrote off more of their receivables
  - ROE is unaffected

- On 12/31/2003, Walmart sold one of their factories and gained $2,000 on sale
  - ROE would increase

Sears' Operating Efficiency

- Let's define Inventory Turnover = $\frac{COGS}{Ending\ Inventory}$
- Sears Inventory Turnover = $\frac{26{,}231}{5{,}335} = 4.92$
- Assume that Sears uses LIFO. Under "normal circumstances" (i.e. rising prices and *no reduction in inventory*) would inventory turnover be higher or lower under FIFO?
- Effect on COGS:
  - Decrease
- Effect on Ending Inventory:
  - Increase
- Effect on Inventory Turnover:
  - Decrease

DuPont Decomposition

DuPont Analysis: decomposes ROE into ratios of solvency, profitability, and efficiency.

$$ROE = NI / Equity$$

$$ROE = \frac{NI}{Assets} * \frac{Assets}{Equity}$$ = ROA * Leverage

$$ROE = \frac{NI}{Sales} * \frac{Sales}{Assets} * \frac{Assets}{Equity}$$

= Profit Margin * Asset Turnover * Leverage

DuPont Decomposition

ROE	=	NI/SALES	*	SALES/ASSETS	*	ASSETS/EQUITY		
		Return on sales		Asset utilization		Leverage		
Walmart ROE	=	8,039/246,525	*	246,525/94,685		94,685/39,997	=	20.4%
		3.26%		2.60		2.41		
Sears ROE	=	3,397/41,124	*	41,124/27,723	*	27,723/6,401	=	53.1%
		8.26%		1.48		4.33		

- What happens if Sears pays out cash dividends at the end of the year?
  - Assets decrease (cash goes down)
  - Equity decreases (retained earnings goes down)
  - Asset Utilization goes up
  - Leverage goes up (b/c our ratio is greater than 1)
  - ROE increases

Use the following definitions to solve the practice problems

(All balance sheet items use ending values)

$$Leverage = \frac{Total\ Liabilities}{Total\ Shareholders'Equity}$$

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

$$Net\ Margin\ (\%) = \frac{Net\ Income}{Revenue}$$

$$Gross\ Margin\ (\%) = \frac{Revenue\ -COGS}{Reveunue}$$

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

$$ROE = \frac{Net\ Income}{Shareholders'Equity}$$

$$Asset\ Turnover = \frac{Total\ Assets}{Revenue}$$

Question 1: Ratios and BSE entries

Event/Transaction	Financial Statement Effects
(a) Accrued bad debt expense of $12,000. A/r - Allow For D/a = R/E 12,000 -12,000	Current Ratio: Decrease Return on Assets: Decrease Leverage ratio: Increase
(b) Sold property plant and equipment which cost $20,000 and had accumulated depreciation of $14,000 for $5,000 in cash. Cash PPE - Accum Dep = R/E 5,000 -20,000 -14,000 -1,000	Leverage ratio: Increase Current ratio: Increase Net Income: Decrease

Question 2: DuPont Analysis

Below is basic financial information of CVS for fiscal years 2016 and 2015. Conduct a DuPont analysis for fiscal year 2016. Use Total assets/Total shareholders' equity for leverage ratio.

Item	2016	2015
Total Assets	94,462	92,437
Shareholders' Equity	36,834	37,203
Revenue (Sales)	177,526	153,290
Net income	5,317	5,237

Question 2: DuPont Analysis (cont'd)

CVS	2016
ROE	$5,317 / $36,834 = 14.44%
Profit Margin	$5,317 / $177,526 = 3.00%
Asset Turnover	$177,526 / $94,462 = 1.88
Leverage (Assets/Equity)	$94,462 / $36,834 = 2.56