



# Cash flows and Financial ratios

Introduction to finance and marketing for engineers

Week 2

[aysanrangchian@ucla.edu](mailto:aysanrangchian@ucla.edu)

## Ex 1

Your CFO informs you that you need to purchase \$10 of inventory. You can purchase the inventory or finance it with short-term debt. Identify the changes to the balance sheet and calculate the net working capital under both scenarios.

<i><u>Simplified Balance Sheet</u></i>	
<b><i>Assets</i></b>	
<i>Current Assets</i>	<i>50</i>
<i>Fixed Assets</i>	<i>200</i>
<i>Other Assets</i>	<i>30</i>
<i>Total Assets</i>	<i>280</i>
<b><i>Liabilities</i></b>	
<i>Current Liabilities</i>	<i>20</i>
<i>Long-Term Liabilities</i>	<i>100</i>
<i>Total Liabilities</i>	<i>120</i>
<b><i>Equity</i></b>	
<i>Common Stock</i>	<i>100</i>
<i>Retained Earnings</i>	<i>60</i>
<i>Total Equity</i>	<i>160</i>

# Sol 1

Cash will go down by 10 and Inventory will go up by 10, leaving the Current Assets and the remainder of the Balance Sheet the same.

Net Working Capital is  $CA - CL = 50 - 20 = 30$ .

Net Working Capital did not change but company became slightly less liquid (cash turned into inventory!)

<i>Simplified Balance Sheet</i>	
<b>Assets</b>	
Current Assets	50
Fixed Assets	200
Other Assets	30
Total Assets	280
<b>Liabilities</b>	
Current Liabilities	20
Long-Term Liabilities	100
Total Liabilities	120
<b>Equity</b>	
Common Stock	100
Retained Earnings	60
Total Equity	160

# Sol 1

Alternatively, we can finance the purchase of inventory via short term debt, in which case notes payable which is a current liability will increase. Under this scenario, the size of the Balance Sheet is increasing from 280 to 290.

Net Working Capital = CA-CL=60- 30=30.

Net Working Capital did not change but company became more in debt (short term debt went up!)

<i><u>Simplified Balance Sheet</u></i>	
<b><i>Assets</i></b>	
Current Assets	60
Fixed Assets	200
Other Assets	30
Total Assets	290
<b><i>Liabilities</i></b>	
Current Liabilities	30
Long-Term Liabilities	100
Total Liabilities	130
<b><i>Equity</i></b>	
Common Stock	100
Retained Earnings	60
Total Equity	160

## Ex 2

Using the following information for this company:

Inventory	2,000	To be paid by Y Inc.	6,500
Office Building	10,000	Common Stock	5,000
Cash	5,000	Short-term Loans	4,000
Owed to Company X	2,500	Machines	3,000
Bonds	12,000	Intangible Assets	5,000
Retained Earnings		Deferred Taxes	1,000

Create a balance sheet for the year 2012.





# Solution

## Assets:

### Current Assets:

Cash: 5,000

Accounts Receivables: 6,500

Inventory: 2,000

Total Current Assets: 13,500

Property Plant and Equipment: 13,000

Intangible Assets: 5,000

Net Assets: 31,500

$31,500 (A) = 19,500 (L) + 12,000 (E)$

## Liabilities:

### Current Liabilities:

Accounts Payable: 2,500

Short Term Debt: 4,000

Total Current Liabilities: 6,500

Long-term Debt: 12,000

Deferred Taxes 1,000

Net Liabilities: 19,500

## Equity:

Common Stock: 5,000

Retained Earnings: 7,000

Net Equity: 12,000

$31,500 (A) = 19,500 (L) + 12,000 (E)$

# Income statement

Income Statement: shows the revenues and expenses for a company over a time period (ie. quarterly)

Total Revenue (Operating Revenue): amount of money that was made by the company (top line)

Cost of Revenue (Cost of Goods Sold): the cost to produce our commodity

Gross Profit: the amount of profit taken prior to looking at non-production related expenses

Note: the following is an income statement from Twitter Inc. (TWTR)

Period Ending	Dec 31, 2013	Dec 31, 2012	Dec 31, 2011
Total Revenue	664,890	316,933	106,313
Cost of Revenue	266,718	128,768	61,803
Gross Profit	398,172	188,165	44,510
Operating Expenses			
Research Development	593,992	119,004	80,176
Selling General and Administrative	440,011	146,244	91,745
Non Recurring	-	-	-
Others	-	-	-
Total Operating Expenses	-	-	-
Operating Income or Loss	(635,831)	(77,083)	(127,411)
Income from Continuing Operations			
Total Other Income/Expenses Net	(4,455)	399	(1,530)
Earnings Before Interest And Taxes	(647,146)	(79,170)	(129,746)
Interest Expense	-	-	-
Income Before Tax	(647,146)	(79,170)	(129,746)
Income Tax Expense	(1,823)	229	(1,444)
Minority Interest	-	-	-
Net Income From Continuing Ops	(645,323)	(79,399)	(128,302)
Non-recurring Events			
Discontinued Operations	-	-	-
Extraordinary Items	-	-	-
Effect Of Accounting Changes	-	-	-
Other Items	-	-	-
Net Income	(645,323)	(79,399)	(128,302)
Preferred Stock And Other Adjustments	-	-	(35,816)
Net Income Applicable To Common Shares	(645,323)	(79,399)	(164,118)



# Income statement

Operating Expense: day-to-day expenses

ie. R&D, administrative expense for sales

Depreciation: accounting for equipment (bought long ago) and their usage for producing the goods

Operating Income: revenue we made after accounting for day-to-day expenses





# Income statement

Earnings Before Interest and Taxes (EBIT): amount of money that was made by the company before tax

Interest Expense: amount of money paid for interest from funding by debt

Note: EBIT only accounts for operating side and underestimates our cash flow due to depreciation



# Income statement

Pre-tax Income: earnings before tax

Net Income (Bottom Line): the money we actually earned

Retained Earnings: money kept to fund business

Dividends: money distributed to shareholders



# Financial ratios

Financial Ratios: is a form of financial statement analysis that gives quick indication of

a firm's financial performance in several key areas

The ratios are categorized as :

- Short-term Solvency (Liquidity) Ratios
- Long-term Solvency (Leverage) Ratios (Debt Management Ratios)
- Asset Management Ratios
- Profitability Ratios
- Market Value Ratios

# Short term solvency ratios

Short-term Solvency (Liquidity) Ratios: indicates how easily can a firm pay off its short term debts

$$Ratio_{current} = \frac{Assets_{current}}{Liabilities_{current}}$$

Current Ratio: is the firm able to pay off its short term debts

Quick Ratio: is the firm able to pay off its debts with its more liquid assets (cash and accounts receivables)

$$Ratio_{quick} = \frac{Assets_{current} - Inventory}{Liabilities_{current}}$$

Cash Ratio: if I lend to this firm would they be able to immediately pay me back

$$Ratio_{cash} = \frac{Cash}{Liabilities_{current}}$$



# Long term solvency ratios

Long-term Solvency (Leverage) Ratios: measures a firm's financial leverage and whether the firm will be able to avoid financial distress in the long run

Total Debt Ratio (Debt to Assets):

$$Ratio_{total\ debt} = \frac{Assets_{total} - Equity_{total}}{Assets_{total}}$$

Debt-Equity Ratio:

$$Ratio_{debt\ equity} = \frac{Debt_{total}}{Equity_{total}}$$

Equity Multiplier:

$$Ratio_{equity\ mult} = \frac{Assets_{total}}{Equity_{total}}$$

Note: the above 3 ratios all look at how much debt is used to finance the assets





# Asset management ratios

*Asset Management Ratios*: measures the firm's success in managing its assets to generate sales

*Inventory Turnover*: how many times do we finish and replenish our inventory

$$Ratio_{inv\ turnover} = \frac{COGS}{Inventory}$$

*Days' Sale Inventory*: how long does it take for empty inventory

$$Ratio_{day\ sales\ turnover} = \frac{365}{Ratio_{inv\ turnover}}$$



# Asset management ratios

Asset Management Ratios: measures the firm's success in managing its assets to generate sales

Receivables Turnover: how many times do we get paid via accounts receivables

$$Ratio_{rec\ turnover} = \frac{Sales}{Accounts\ receivables}$$

Day's Sale in Receivables: how often do we get paid via accounts receivables

$$Ratio_{days\ sales\ receivable} = \frac{365}{Ratio_{rec\ turnover}}$$

Total Asset Turnover: how well we are using our assets to generate sales

$$Ratio_{assets\ turnover} = \frac{Sales}{Assets}$$



# Profitability ratios

Profitability Ratios: measures the firm's success in generating income

Profit Margin: indicates the dollars in income that the firm earns on each dollar of sales

$$\text{Profit margin} = \frac{\text{Net income}}{\text{Sales}}$$

Return on Assets (ROA): indicates the dollars in income earned by the firm on its assets

$$ROA = \frac{\text{Net income}}{\text{Assets}}$$

Return on Equity (ROE): indicates the dollars of income earned by the firm on its shareholders' equity

$$ROE = \frac{\text{Net income}}{\text{Equity}}$$



# Market value ratios

Market Value Ratios: relates the market value, the stock price, to book values obtained from the firm's financial statements

Earnings Per Share (EPS): indicates the dollars earned in each share

$$EPS = \frac{\text{Net income}}{\text{Shares outstanding}}$$

Price Earnings Ratio (PE): indicates how much investors are willing to pay per dollar of current earnings

$$EP = \frac{\text{Price per share}}{EPS}$$



# DuPont identity

DuPont Identity: expression that breaks down Return on Equity (ROE) into the following

- Equity Multiplier (financial leverage)
- Total Asset Turnover (asset use efficiency)
- Profit Margin (operating efficiency)

If ROE is unsatisfactory, we can locate where the business is underperforming

$$ROE = \frac{Assets}{Equity} \times \frac{Sales}{Assets} \times \frac{Net\ income}{Sales}$$





## Exercise 3

Syed's Industries has accounts receivable of \$700, inventory of \$1,200, sales of \$4,200, and cost of goods sold of \$3,400.

How long does it take Syed's to both sell its inventory and then collect the payment on the sale?



## Solution

Inventory turnover =  $3,400 / 1,200 = 2.83$ ;

Days in inventory =  $365 / 2.83 = 128.98$ ;

Accounts receivable turnover =  $4,200 / 700 = 6$ ;

Days' sales in receivables =  $365 / 6 = 60.83$ ;

Total days in inventory and receivables =  $128.98 + 60.83 = 189.81$  days  
= 190 days (rounded)



## Exercise 4

Samuelson's has a debt-equity ratio of 40%, sales of \$8,000, net income of \$600, and total debt of \$2,400.

What is the return on equity?



## Solution

$$\text{debt-equity} = \text{debt} / \text{equity} = 0.40$$

$$\text{debt} = 2,400$$

$$\text{debt-equity} = 2,400 / \text{equity} = 0.40$$

$$\text{equity} = 2,400 / 0.40 = 6,000$$

$$\text{ROE} = \text{Net Income} / \text{equity} = 600 / 6,000 = 0.10$$



## Exercise 5

Which two of the following are most apt to cause a firm to have a higher price-earnings ratio?

- I. slow industry outlook
- II. high prospect of firm growth
- III. very low current earnings
- IV. investors with a low opinion of the firm

- A. I and II only
- ☒ B. II and III only
- C. II and IV only
- D. I and III only
- E. III and IV only





## Exercise 6

The higher the inventory turnover measure, the:

- A. greater the amount of inventory held by a firm.
- B. faster a firm collects payment on its sales.
- C. longer it takes a firm to sell its inventory.
- ☒ D. faster a firm sells its inventory.
- E. lesser the amount of inventory held by a firm.

## Exercise 7

X Inc. acquired a small competitor, Y Inc., by paying three times Y's total assets. **Immediately** after the purchase,

- A. Company X's balance sheet is not affected.
- B. Company X's balance sheet went up by an amount equal to purchase price.
- C. Company X's balance sheet went up by an amount equal to Y's assets.
- ☒ D. Company X's income statement is not affected.
- E. None of the above