

Key concepts from

# **FINANCIAL STATEMENTS**

# Objectives

- Goal: **Quick overview** of financial statement concepts that are **most important** for corporate finance
- Important for:
  - Capital budgeting:
    - e.g., projecting cash flows
    - Begins with financial statement data
    - Requires good knowledge of the mechanics of working capital, depreciation, taxes...
  - Valuation and capital structure:
    - e.g., what key ratios really capture
    - Market-to-book, ROA, ROE, leverage...

# **BALANCE SHEETS**

(AND HOW WE THINK ABOUT THEM DIFFERENTLY IN  
ACCOUNTING VS. FINANCE)

# Balance Sheet

- Lists firm's Assets & Liabilities
- A snapshot of the firm's (book) financial position at a given point in time
- Balance Sheet Identity:  
**Assets = Liabilities** ( + Stockholders' Equity; we should really think of equity as just one specific kind of liability)

# Three ways of thinking about a balance sheet

## 1. Accounting

- $\text{Book Assets} = \text{Book Liabilities}$

## 2. Financing (book values)

- $(\text{Net}) \text{ Operating Assets} = (\text{Net}) \text{ Book Capital}$
- We can get to this by rearranging (1.)

## 3. Financing (market values)

- $\text{Enterprise Value} = \text{Market Value of Capital}$
- Here we'll need market values  
→ Need to move beyond just accounting numbers

# Example: Balance Sheet (Global Corp.)

Assets		Liabilities	
<u>Current Assets</u>		<u>Current liabilities</u>	
Cash	23.2	Accounts Payable	29.2
Accounts receivable	18.5	Notes payable/short-term debt	5.5
Inventories	15.3	Total Current Liabilities	34.7
Total Current Assets	57.0	<u>Long-Term Liabilities</u>	
<u>Long-Term Assets</u>		Long-term debt	113.2
Property, plant and equipment	113.1	<u>Stockholder's Equity</u>	
Total Long-term Assets	113.1	Common stock and paid-in surplus	8.0
		Retained earnings	14.2
		Total Stockholder's equity	22.2
Total Assets	170.1	Total Liabilities (and stockholder's equity)	170.1

# Current Assets

Assets convertible to cash or other benefits in **less than one year**

- Cash and other marketable securities
  - Cash, treasury bills and bonds, stocks and bonds of other firms, etc...
  - Usually easy to sell and convert to cash
- Accounts receivable
  - amounts owed to the firm by its customers
- Inventories
  - raw materials, work-in-progress, finished goods
- Other current assets
  - includes items such as prepaid expenses

# Long-Term Assets

Assets that produce benefits for **more than one year**

- E.g., buildings, machinery, office equipment, etc...
- Most of these assets' value is reduced yearly through **depreciation**
  - Depreciation schedule is determined by accounting rules, and not directly related to actual decreases in economic value



# Liabilities

- Current Liabilities
  - Short-term debt or portion of long-term debt to be paid within a year
  - Accounts payable
    - Amount firm owes to suppliers
  - “Accrual items “
    - E.g., wages or taxes that are owed but have not yet been paid; deferred or unearned revenue (firm has received payment but not yet delivered product)
- Long-Term Liabilities
  - Long-term debt (maturing in more than a year)
- Stockholders’ equity
  - Also called “book value of equity”

# Let's rearrange the balance sheet!

- Move liabilities that is part of the **operations of the business** (*i.e.*, not financing) to the left
  - This example is simple: Only accounts payable should be moved
  - Normally, also “accrued expenses”, “other liabilities”, “income taxes payable”, etc...
- Move cash (and any other **non-operating** assets) to right
  - Subtract cash from debt to get “Net debt”
  - Technically we only move and subtract only “excess cash”, but how much is excess?

“Operating Accounts”		“Financial Accounts”	
<u>Net Working Capital</u>		<u>Net Debt</u>	
Accounts receivable	18.5	Notes payable/short-term debt	5.5
Inventories	15.3	Long-term debt	113.2
- Accounts Payable	-29.2	- Cash	-23.2
Total Net Working Capital	4.6	Total Net Debt	95.5
<u>Net Fixed Assets</u>		<u>Stockholder's Equity</u>	
Property, plant and equipment	113.1	Stockholder's equity	22.2
Net Operating Assets	117.7	Net Book Capital	117.7

# Book Values vs. Current Cost/Liquidation Values

The current price of an asset is often different from book value!

## 1. Book value

- Value as recorded in balance sheet
- Book asset value = Cost – Cumulative depreciation (can be very different from current price)
  - E.g, consider an office building in New York that was purchased 40 years ago

## 2. Liquidation value

- What we could buy/sell the assets for
- If book values are **very close** to the liquidation value of most assets, then book value of equity might be used to estimate the *liquidation value* of the firm:  
*“what would equity holders have left if we sold everything and paid off all debts?”*

# Example

Assets		Liabilities	
<u>Current Assets</u>		<u>Current liabilities</u>	
Cash	23.2	Accounts Payable	29.2
Accounts receivable	18.5	Notes payable/short-term debt	5.5
Inventories	15.3	Total Current Liabilities	34.7
Total current	57.0	<u>Long-Term Liabilities</u>	
<u>Long-Term Assets</u>		Long-term debt	113.2
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For what items on balance sheet are book values often close to the market value?

# Market value of the firm

- Enterprise value (EV) is the **market value** of the underlying **business operations**:

$$\text{Enterprise value} = \underbrace{\text{Market capitalization} + \text{Debt}}_{\text{Value of all financial claims on the firm}} - \text{Excess cash}$$

- Market capitalization is the market value of equity:

$$\text{Price per share} * \text{Number of shares}$$

- Should we use book or market values of debt?
- For cash, the book market is the same as market value! (unless something funny is going on, where a dollar isn't actually worth a dollar...)

# Example: Market capitalization

- Global Corp. has 3.6 million shares outstanding, and these shares trade at \$10 per share
- What is Global's market capitalization?
- How does Global's market cap compare to its book value of equity?

## **Solution:**

- Global's market capitalization is:  $(3.6 \text{ million shares}) \times (\$10/\text{share}) = \$36 \text{ million}$
- Recall: Global's book value of equity was \$22.2 million (see balance sheet)
- What could drive any difference between these values?

# Example: Enterprise value

- Global's market cap is \$36 million
- From the balance sheet, we see the firm has \$5.5 million in short-term debt, \$113.2 million in long-term debt, and \$23.2 million in cash.
- What is Global's enterprise value?

## Solution

- Global's enterprise value is:  $\$36 + \$5.5 + \$113.2 - \$23.2 = \$131.5$  million
- What's the economic meaning of this number?
- It's the market's expectation of the present value of all *future cash flows* that are going to go to the firm's financial claimants (e.g, owners of the firm's debt and equity)!

# Let's transform the balance sheet into market values

- Market value of the *business operations* is not tied to book value of operating assets
- How much the business is worth depends on how much *free cash flow* (FCF) the business is expected to generate and with what risk

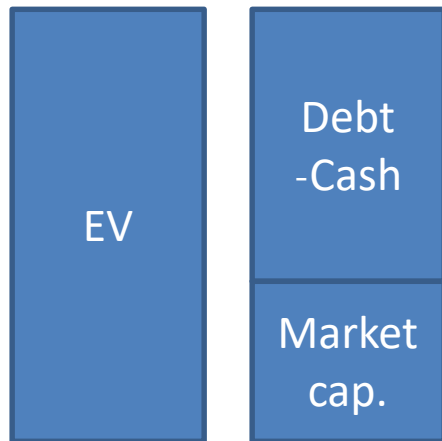
We usually approximate market value of debt with book value of debt

Assets		Liabilities	
Enterprise Value = PV(Free Cash Flow)		<u>Net Debt (Market Value)</u>	
		Notes payable/short-term debt	5.5
		Long-term debt	113.2
		- Cash	-23.2
		Net Debt	95.5
		<u>Market Value of Equity</u>	
		Market Capitalization	36
Enterprise Value	131.5	(Net) Market Value of the firm	131.5

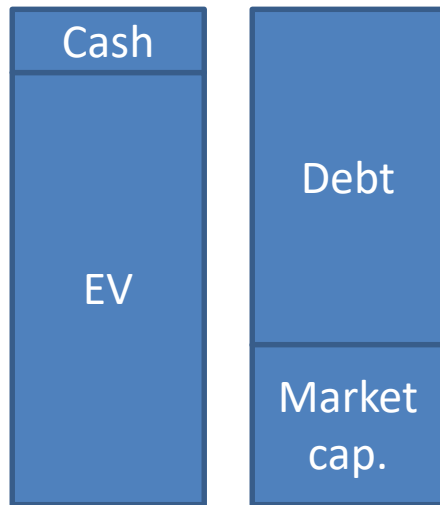
We know these numbers have to be the same!



# We can rearrange this identity as we wish...

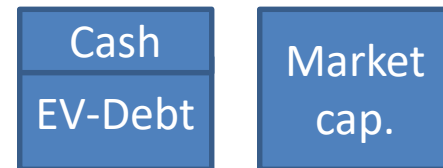


$$EV = \text{Net Debt} + \text{Market cap.}$$



$$EV + \text{Cash} = \text{Debt} + \text{Market cap.},$$

*i.e., EV + Cash = "Financial claims on the firm"*



$$EV - \text{Debt} + \text{Cash} = \text{Market cap.},$$

*i.e., EV - Net Debt = Market cap*  
*(we're going to use this a lot!)*

# Example

- Imagine a restaurant business in San Francisco
- It's only asset is a building the restaurant purchased for \$100,000 in the 1970s when the restaurant was founded
- Now value on the building has since been depreciated to \$40,000
- The restaurant could sell the building now for \$3 million
- The restaurant produces \$1 million in annual profits (free cash flows), and the restaurant has no debt or cash
- What are some different asset values we can think about here?

# **INCOME STATEMENT**

# The Income Statement

- Lists firm's revenues and expenses over a period of time

The “top line” shows net sales (or “revenues”)

The “bottom line” shows net income (or “earnings”)

**Example:** Global Corp.'s Income Statement

Net sales	186.7
Cost of sales	−153.4
<b>Gross Profit</b>	33.3
Selling, general, and administrative expenses	−13.5
Research and development	−8.2
Depreciation and amortization	−1.2
<b>Operating Income</b>	10.4
Other income	—
<b>Earnings Before Interest and Taxes (EBIT)</b>	10.4
Interest income (expense)	−7.7
<b>Pretax Income</b>	2.7
Taxes	−0.7
<b>Net Income</b>	2.0
Earnings per share:	\$0.56
Diluted earnings per share:	\$0.53

# Earnings per share (EPS)

- EPS is net income on a per-share basis:
  - Global Corp. has a net income of \$2.0 million, and 3.6 million shares (the number of shares are not listed in the income statement, so need to find those elsewhere)
  - What's the EPS?
  - $$\frac{\text{Net income}}{\text{\# Shares}} = \frac{\$2.0 \text{ million}}{3.6 \text{ million shares}} = \$0.556 \text{ per share}$$
- “Fully diluted” EPS increases number of shares by:
  - Stock options held by employees
  - Shares that can be converted from any convertible bonds
- Suppose Global employees have been given 0.2 million options, what is Global's fully diluted EPS?

# EBITDA

- EBITDA: Earnings before interest, taxes, depreciation, and amortization
- Used A LOT! But what's it good for?
- **Rough measure** of how much cash firm earned from its business and is left for: Equity holders (E), Debt holders (I), government (T), and to pay for new investments (D&A are not cash flows, but investments are—in the long run they cancel each other out!)

	2010
Net sales	186.7
Cost of sales	−153.4
<b>Gross Profit</b>	33.3
Selling, general, and administrative expenses	−13.5
Research and development	−8.2
Depreciation and amortization	−1.2
<b>Operating Income</b>	10.4
Other income	—
<b>Earnings Before Interest and Taxes (EBIT)</b>	10.4

- What is the EBITDA for Global Corp in 2010?

# **THE STATEMENT OF CASH FLOWS**

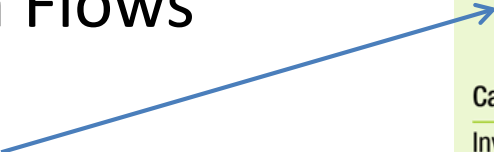
# Statement of Cash Flows

- The statement of cash flows uses information from both the income statement and balance sheet to determine:
  1. how much cash the firm has *generated* during the year
  2. how that cash has been *allocated*
- Three sections (often called “activities”):
  1. Operating activities
  2. Investment activities
  3. Financing activities
- The final line calculates the **sum** across all three activities  
= The **overall change in the firm’s cash balance** over the time period
- Sanity check: this final line should correspond with the **change in cash on the balance sheet** between this year and last year



# Example: Global Corp.'s Statement of Cash Flows

(note: it's very important to understand the ***sign*** of the cash flow effects of receivables, payables, inventory, etc...)



Operating activities	
Net income	2.0
Depreciation and amortization	1.2
Cash effect of changes in	
Accounts receivable	−5.3
Accounts payable	2.7
Inventory	<u>−1.0</u>
Cash from operating activities	−0.4
Investment activities	
Capital expenditures	−33.4
Acquisitions and other investing activity	
Cash from investing activities	−33.4
Financing activities	
Dividends paid	−1.0
Sale or purchase of stock	—
Increase in short-term borrowing	2.3
Increase in long-term borrowing	<u>35.2</u>
Cash from financing activities	36.5
Change in cash and cash equivalents	2.7

# Operating Activities

- Depreciation:
  - Add back depreciation to net income, since it is not a cash outflow (but has been deducted as an expense on the income statement)
- Accounts receivable (AR):
  - A sale has been recorded as part of revenues which flows down to net income, but the customer has not paid yet, so we adjust by *subtracting* any increases in accounts receivable
  - *i.e.*, an increase in AR means the firm is lending more money to customers (so it has less cash)
- Accounts payable (AP):
  - Conversely, we *add* any increases in accounts payable
  - AP represents borrowing by the firm from its suppliers by paying them slowly—more borrowing means more cash on hand right now
- Inventory:
  - We *subtract* increases in inventory
  - Increases to inventory are not recorded as an expense for calculating net income; but, the firm has still *paid* for this inventory which means a cash outflow for the firm

# Investment and Financing Activities

- Investment Activities shows cash flows from:
  - Capital purchased and sold
    - e.g., machinery, plant, land...
  - Investment securities purchased and sold
    - e.g., treasury bonds, or other investment securities, except the firm's *own* equity and debt
- Financing Activities shows cash flows from:
  - Dividends paid
  - Cash received from sale of stock or cash spent repurchasing shares
  - Changes in debt
  - Issuing debt or stock leads to positive cash flow, repayment or repurchasing negative

# Depreciation and Taxes

- Depreciation is not a cash flow!
- But, depreciation affects cash flows indirectly, because depreciation affects pre-tax earnings, which affects taxes, which is a cash flow!
- In other words:

Depreciation   Pre-tax earnings   Taxes   Cash flows 

# Example: Depreciation and taxes

- Suppose Global Corp. has an additional \$1 million in depreciation, and Global's tax rate is 26%
- What would be the impact on Global's net income?
- How would it impact Global's cash flow?

## Solution

- Operating income, EBIT, and pretax income would all fall by \$1 million (EBITDA is unchanged)
- This would reduce Global's tax bill by  $26\% \times \$1 \text{ million} = \$0.26 \text{ million}$
- So Net Income would fall by  $1 - 0.26 = \$0.74 \text{ million}$
- On the cash flow statement, we start with \$0.74 million less, but *add back* the depreciation of \$1 million as it is not a cash outflow
- So cash from operating activities would rise by  $-0.74 + 1 = \$0.26 \text{ million}$ 
  - No effect on investment or financing activities
- Global's cash balance would increase by \$0.26 million; this is equal to the amount of tax savings!
- Takeaway?
- Depreciation reduces a firm's taxes, and therefore increases the firm's cash flow
- **Bad** for earnings, but **good** for investors!

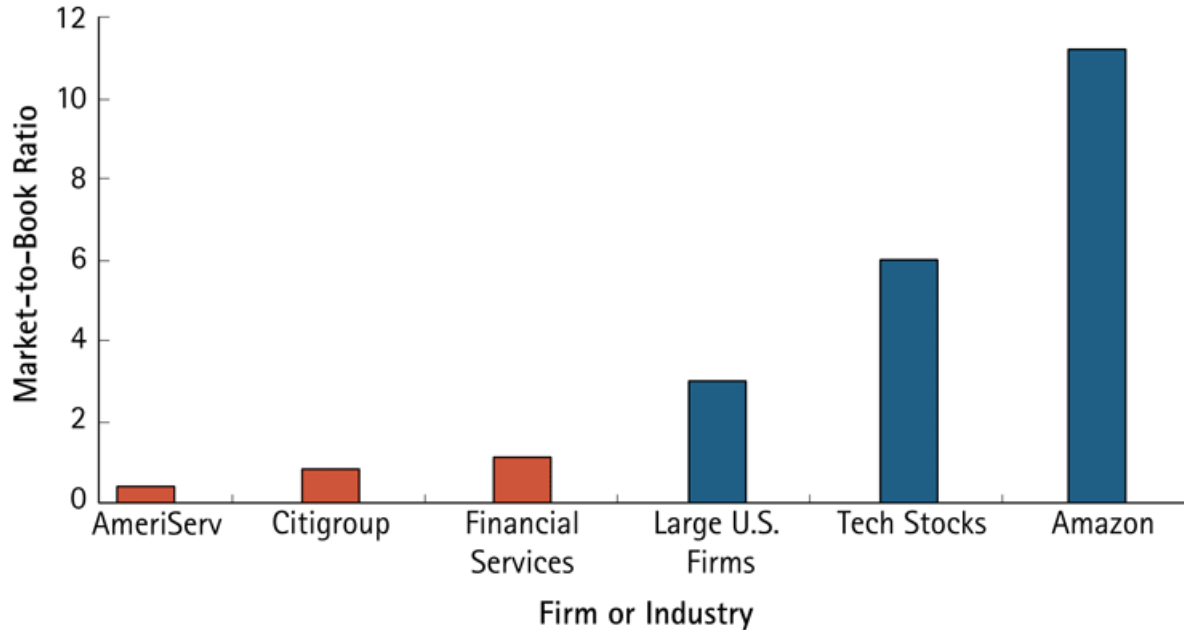
# **COMMONLY USED RATIOS**

# Market to Book Ratio

$$\text{Market-to-Book} = \frac{\text{Market capitalization}}{\text{Book value of equity}}$$

- Also called “Price-to-Book” (when on a per-share basis)
- Often used to classify firms into:
  - “Value” (low M/B)
  - “Growth” (high M/B)

# Examples of Market-to-Book Ratios





# P/E Ratio

$$\frac{P}{E} = \frac{\text{Market capitalization}}{\text{Net income}} = \frac{\text{Share price}}{\text{EPS}}$$

- One of the most widely used ratios to compare firm valuations
- A higher P/E ratio usually implies:
  - The market expects net income to grow faster, and/or...
  - The earnings are less risky (lower systematic risk)

# Sales Profitability Ratios

- Gross margin - how much a company earns from each dollar of sales after paying for the *direct cost* of the sold goods:

$$\text{Gross margin} = \frac{\text{Gross profit}}{\text{Sales}}$$

- Operating margin - how much a company earns before interest and taxes from each dollar of sales (includes overhead such as SG&A, R&D, depreciation in costs):

$$\text{Operating margin} = \frac{\text{Operating income}}{\text{Sales}}$$

- Net profit margin – how much that is available to equity holders after the firm also pays interest and taxes (from each dollar of sales):

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

# ROE and ROA

## Return on Equity

$$\text{ROE} = \frac{\text{Net income}}{\text{Book value of equity}}$$

- Comparing firm's income to its book equity value
- However, book equity is often not very meaningful, in which case this ratio isn't meaningful either
- What is this if we use market equity in the denominator instead?
- Both Net income and Book equity are sensitive to leverage choices which means it is senseless to compare this ratio across firms with different leverage

## Return on Assets

$$\text{ROA} = \frac{\text{Net income} + \text{Interest expense}}{\text{Total assets}}$$

- Comparing firm's "income" (flowing to both equity- and debt-holders) to its book assets
- Book assets may also not be very meaningful, especially for firms with lots of cumulated depreciation and for firms with intangible assets
- Note: ROA is sometimes defined as Net Income/Assets; this is poor practice and makes the number even less meaningful! Why?

# Leverage ratios

$$\frac{D}{E} = \frac{\text{Total debt}}{\text{Total equity}}$$

$$\frac{D}{E+D} = \frac{\text{Total debt}}{\text{Total equity} + \text{Total debt}}$$

(D/(E+D) is sometimes called debt-to-capital)

- We often use “Net Debt” (D-C) instead of D, but this can depend on situation
- “Book leverage”
  - Using book values for both equity and debt
- “Market leverage”
  - Using market value for equity
  - Usually, book value for debt, even though market value of debt would technically be better
  - **Why** do we often still use book value for debt?

# Interest Coverage Ratio

$$\text{Interest coverage} = \frac{\text{Some measure of income}}{\text{Interest payments}}$$

- Captures how easily a firm is able to cover its interest payments
- Which income measure is best in numerator?
  - Depends slightly on the situation, but either *operating income*, *EBIT*, or *EBITDA*
  - **Do not use Net Income** in this ratio! **Why?**

# Working Capital/Liquidity

NWC (net working capital)=Current assets–Current liabilities

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{inventory}}{\text{Current liabilities}}$$

- These measure whether firm has (short-term) assets available to meet bills that are coming due

# Working capital turnover

- Measures the “efficiency” of how much working capital the business requires
- The less working capital, the better! (because less money is tied up in operations)

$$\text{Receivable days} = \frac{\text{Receivables}}{\text{Sales}} * 360$$

$$\text{Inventory days} = \frac{\text{Inventory}}{\text{COGS}} * 360$$

$$\text{Payable days} = \frac{\text{Payable days}}{\text{COGS}(+\text{Other costs reflected in payables})} * 360$$

# Example: Ratios & Enterprise Value

- Peabody Products has:
  - share price of \$46.15 with 316.2 million shares outstanding,
  - a market-to-book ratio of 7.99,
  - a book debt-to-book equity ratio of 2.64,
  - cash of \$560 million
- What is Peabody's market capitalization?
- What is Peabody's enterprise value?

## Solution

- Peabody has market capitalization of:  $\$46.15 \times 316.2 \text{ million shares} = \$14.59 \text{ billion}$
- To find the enterprise value, we need to solve for the (book) value of debt:
  - Market-to-book = 7.99 =  $\$14.59 \text{ billion} / \text{book equity}$ , then book equity =  $\$14.59 \text{ billion} / 7.99 = \$1.83 \text{ billion}$
  - Book debt-to-Book equity = 2.64, so the book value of Peabody's debt is  $\$1.83 \text{ billion} \times 2.64 = \$4.83 \text{ billion}$
- Thus, Peabody's enterprise value is (Enterprise Value = Market Value of Equity + Debt – Cash) =  $14.59 + 4.83 - 0.56 = \$18.86 \text{ billion}$ .



**WHERE TO FIND FINANCIAL  
STATEMENTS?**

# Sources of financial statement data

- Commercial databases
  - E.g., CapitalIQ, Bloomberg
  - These are available in the Market Information Lab
  - Benefits: Data is standardized; Can quickly be collected and compared across many firms and years
  - Downsides: Can be expensive; Standardization may lead to important details that underlie the numbers being omitted
- Securities and Exchange Commission (SEC) website
  - <http://www.sec.gov/edgar.shtml>
  - Companies that publicly sell securities are required to file financial statements with the SEC
  - Benefits: Free; Includes a lot more detailed information (including management's discussion, footnotes, etc)
  - Downsides: Can only analyze one financial statement at a time
  - (This is usually the source of the data that is used in the commercial databases)