Lecture 8, Nov 1, 2023

Introduction to Accounting

- Two broad categories of accounting:
  - Managerial accounting: focused on internal use for decision makers, future oriented
  - Financial accounting: focused on external use by investors and government, typically must conform to standards
- Businesses are organized into 3 types:
  - Proprietorship: single person owns the entire business, who takes all liability
  - Partnership: two or more people own the business, who share the liability
  - Corporation: shareholders own the business, run by a board of directors elected by shareholders
- Accountants follow *generally accepted accounting principles*, or GAAP, a set of professional guidelines
- Main accounting principles:
  1. Entity concept
  2. Relevance characteristic
  3. Reliability/objectivity principle
  4. Cost principle
  5. Going-concern concept
  6. Stable monetary unit concept
- A *financial statement* is financial information about a business prepared in a systematic format; consists of:
  - Income statement: presents sales and expenses over time
  - Balance sheet: provides a snapshot summary of the company's account
    - The income statement takes us from the balance sheet from one point in time to another
    - Balance sheet units are dollars, income statement units are dollars per time
  - Statement of cash flow: summarizes the company's use of cash (can be derived from the income statement and balance sheet)
  - Statement of retained earnings: information about a firm's retained earnings, net income, amount distributed to stockholders
- There are 5 primary *accounts*:
  - On the balance sheet: assets = liabilities + equity
    - These are permanent
    - Assets: things the business has that it uses to make money
      - Short term current assets, e.g. cash, accounts receivable, inventory, etc
      - Long term assets, e.g. land, buildings, equipment
    - Liabilities: debts of the company
      - e.g. bank loans, notes payable, accounts payable, etc
      - Current liabilities are ones due within a year, long-term liabilities are due more than a year out
    - Equity: owners' claims to the assets of a corporation
      - Includes historic money invested and retained earnings
  - On the income statement: net income = revenues - expenses
    - These are temporary, closed at the end of a period and transferred to the balance sheet
- During each period, we take the retained earnings from the start, add the net income, subtract dividends, and get the ending balance of retained earnings
- *Transactions* are events that affect the accounts
- *Accrual accounting* means to record transaction when they occur, not when the cash is actually exchanged; this is opposed to *cash basis* accounting, where transactions are recorded when the cash is exchanged
  - Generally the first is much more useful to us

Double-Entry Accounting

- Each transaction has associated with it a *debit* and a *credit*

- Some accounts are "left hand side" accounts while some are "right hand side" accounts
  - Debits are increases to the left hand side while credits are increase to the right hand side
- Assets are on the left, while liabilities and equity are on the right
  - The retained earnings account (equity) increases with revenue, so revenue is considered a right hand side account
  - Expenses are considered a left hand side account
- Example: an owner of the business invests $50000 cash in the business
  - This cash goes into assets, so we increase assets by $50000; assets is a left hand side account so this is a debit
  - The associated credit is an increase in the common shares account, which is an equity account (right hand side)

Financial Ratios

- Financial ratios are a quick and dirty way for us to value a business
- These can be used as metrics to compare similar companies or against the industry average, typically within the same industry
  - Cross industry comparison is typically not done
- There are 5 types:
  1. Liquidity ratios: ability to pay current liabilities
     - Defined as current assets divided by current liabilities
     - Higher numbers are better, and a ratio below 1 could be a sign of distress
     - The acid-test ratio shows the ability to pay liabilities if they are due immediately
       * This is the ratio of (cash + short-term investments + net current receivables) to liabilities
  2. Efficiency ratios: ability to sell inventory and collect receivables
     - The inventory turnover ratio is the cost of goods sold to average inventory
     - This is a measure of the number of times that we would sell the average inventory in a given year
       * Note that if we change the time period in question, we have to adjust accordingly
     - Larger companies are generally less efficient on this front – lower inventory turnover ratio means more money is tied up in inventory
     - We can also measure this by days' inventory, the ratio of average inventory to average cost of goods sold in a day
       * This is the inverse of inventory turnover multiplied by the number of days in the period being analyzed
     - Accounts receivable turnover is the ratio of net credit sales to the average net accounts payable
     - Days' receivables is the ratio of average receivables to average sales per day
       * This is on average how many days it takes to receive money from customers
  3. Leverage ratios: ability to pay long-term debt
     - The debt ratio is the ratio of total liabilities to total assets (the proportion of assets financed with debt)
     - Times-interest-earned is the ratio of income from operations (sometimes EBIT) to the interest expense in the same period
       * This is how many times our income can cover the interest expense
  4. Profitability ratios
     - The profit margin is the ratio of net income to net sales (i.e. how much profit we make off of every dollar in sales)
     - Return on assets (ROA) measures how profitably the company uses its assets; usually calculated as net income to assets
       * This is the ratio of income to how much was invested in the company
       * Sometimes calculated as (net income + interest times 1 minus taxes) over assets
     - Return on equity (ROE) is ROA but uses equity instead of all assets
     - Earnings per share (EPS) is the amount of profit on a per-share basis; this is the ratio of net income to number of shares

5. Performance ratios: analysis of shares as an investment
   - The price to earnings (P/E) ratio is the ratio of share price to earnings per share
     * A high P/E ratio could mean that the stock is overvalued, or that high growth is expected
     * This is not used for companies with zero or negative earnings
     * Note that a company with more debt would have a higher P/E ratio than an equivalent company with less debt
   - Dividend yield is the ratio of dividend per share to price per share
     * Mature and stable companies tend to pay dividends, while high growth companies tend to not pay dividends and instead reinvest the money
   - Market capitalization is the total market value of a company's outstanding shares of stock (not a ratio)
     * Companies are categorized by size by market capitalization: large-cap (10B+), mid-cap (2B to 10B), small-cap (300M to 2B)

Name	Expression	Interpretation	Notes
Current	$\frac{\text{curr. assets}}{\text{curr. liab.}}$	Ability to pay current liabilities	Below 1 could be a sign of distress
Acid Test	$\frac{\text{cash} + \text{curr. receivables} + \text{s.t. investments}}{\text{curr. liabilities}}$	Ability to pay liabilities if due immediately	Better if > 1
Inventory Turnover	$\frac{\text{COGS}}{\text{avg. inventory}}$	How many times per time period the average inventory is sold	Higher is more efficient; tends to be smaller for larger companies
Days' Inventory	$\frac{\text{avg. inventory}}{\text{avg. COGS per day}}$	Days to sell average inventory	Lower is more efficient
Acc. Receivable Turnover	$\frac{\text{net credit sales}}{\text{net acc. payable}}$	Number of times credit is collected	Higher is more efficient
Days' Receivables	$\frac{\text{avg. acc. receivables}}{\text{avg. sales per day}}$	How many days it takes to collect credit	Lower is more efficient
Days' Payables	$\frac{\text{avg. acc. payables}}{\text{avg. COGS per day}}$	How many days it takes to pay creditors	Higher means more funds are retained, too high might be problematic
Debt Ratio	$\frac{\text{total liabilities}}{\text{total assets}}$	Proportion of assets financed with debt	Higher is more risky
Equity Ratio	$\frac{\text{total equity}}{\text{total assets}}$	Proportion of assets financed with equity	Higher is less risky
Times Interest Earned	$\frac{\text{income or EBIT}}{\text{interest expense}}$	How many times income can cover interest	Higher is better
Profit Margin	$\frac{\text{net income}}{\text{net sales}}$	How many dollars of profit per dollar of sales	Higher is better
Return on Assets (ROA)	$\frac{\text{net income}}{\text{total assets}}$	How profitably the company uses its assets	Higher is more efficient
Return on Equity (ROE)	$\frac{\text{net income}}{\text{total equity}}$	How profitably the company uses equity	Higher is more efficient

Name	Expression	Interpretation	Notes
Earnings Per Share (EPS)	$\frac{\text{net income}}{\text{\# of shares}}$	Amount of profit per share	Higher is better
Price To Earnings (P/E)	$\frac{\text{share price}}{\text{EPS}}$	(Inverse) Relative value in shares	Higher means stock is overvalued or high growth
Dividend Yield	$\frac{\text{dividend per share}}{\text{EPS}}$	Dividends relative to stock price	Mature companies tend to pay more dividends
Market Capitalization	total market value of all shares	Measure of size of company	Large-cap (10B+), mid-cap (2-10B), small-cap (300M-2B)