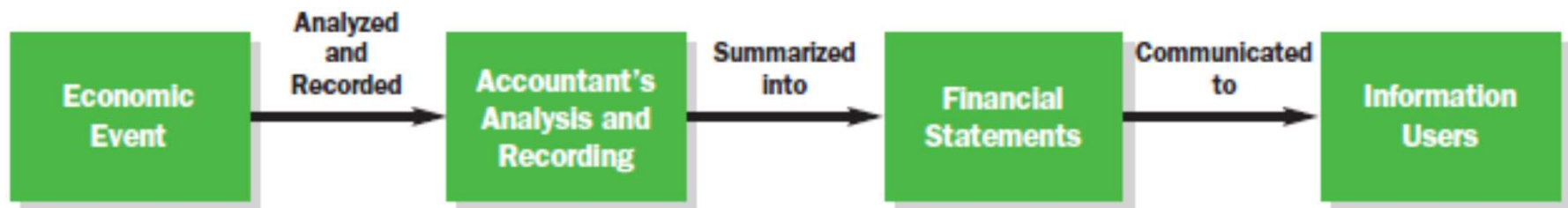


Financial statements analysis

Accounting

- Accounting is the language of business.
- It is the method companies use to communicate financial information to their employees and to the public.
- Accounting is the process of identifying, recording, and summarizing economic information and reporting it to decision makers.
- Accounting as an aid to decision making.



- Financial accounting serves external decision makers, such as stockholders, suppliers, banks, and government agencies.
- Management accounting serves internal decision makers, such as top executives, department heads, college deans, hospital administrators, and people at other management levels within the organization.

Financial statements

- Financial statements are accounting reports with past performance information that a firm issues periodically (usually quarterly and annually).
- Every public company is required to produce these major financial statements:
 - the balance sheet
 - the income statement
 - the statement of cash flows
 - the statement of stockholders' equity

- In addition to the above statements, annual reports usually contain:
 - Footnotes to the financial statements
 - A summary of the accounting policies used
 - Management's Discussion and Analysis (MD & A) of the financial results
 - The auditor's report
 - Management's report on its responsibility and on internal controls
 - Comparative financial data for a series of years
 - Narrative information about the company

Accounting standards

- Generally Accepted Accounting Principles (GAAP) is a common set of rules and standards followed in recording transactions and in preparing financial statements.
- This standardization also makes it easier to compare the financial results of different firms.
- The annual financial statements usually are accompanied by a neutral third party, known as an auditor's report.
- An audit is a systematic examination of a company's financial statements to determine if the amounts and disclosures in the reports are fairly stated and follow GAAP.
- International Financial Reporting Standards (IFRS) is a set of international accounting standards adopted in many countries against GAAP.

Who uses financial statement information?

- **Used extensively by internal users**
 - Management at various levels
 - Performance evaluation
 - Competitive analysis
 - Investment decisions
 - Valuation of targets
 - Current and future employees
 - Is this firm going to meet its payroll and will the stock options be worth anything?

- **Used primarily by external users**
 - Financial intermediaries (analysts)
 - Stock recommendations
 - Lenders
 - Loan decisions
 - Monitoring
 - Investment bankers
 - Valuation for M&A and IPO
 - Top management performance evaluation

Financial statement analysis and business analysis applications

- Focus is more than a mechanical analysis of financial statements.
- Draw heavily on your understanding of finance, economics, marketing, and strategy.
 - Combine that understanding with financial statement information to diagnose problems and come up with solutions/recommendations
- Future Decision Making????

Objectives of Financial Statement Analysis

1. Provide the necessary information required by the users (i.e., supplier, customer, managers, creditors, investors etc.)for the informative decision making
2. Assessing the current and past performance of the company
 - How fast are the revenues growing (Demand Analysis)? –**Growth**
 - What is the operating margin? –**Profitability**
 - What is the efficiency of asset usage? –**Turnover**
 - Do I have an optimal mixture of debt and equity financing? –**Financial Leverage**

3. Historical, present, and expected ratios helps in decision making
 - Predict expected returns
 - Assess the risk associated with those returns
4. Useful for evaluation, planning, and valuation
5. Minimize the Chances of Fraud
6. Eliminating Discrepancies if any

Some Basic Concepts on Accounting

- **Entity concept:** An accounting entity is an organization or a section of an organization that stands apart from other organizations and individuals as a separate economic unit.
- **Going Concern Convention:** The assumption that an entity will persist indefinitely.
 - This notion implies that a company will use its existing resources, such as plant assets, to fulfil its general business needs rather than sell them in tomorrow's real estate or equipment markets.
- **Materiality Convention:** An item should be included in a financial statement if its omission or misstatement would tend to mislead the reader of the financial statements under consideration.

- **Measuring Income**

- Accrual Basis: Accounting method in which accountants record revenue as a company earns it and expenses as the company incurs them—regardless of when cash changes hands.
- Cash Basis: Accounting method that recognizes revenue when a company receives cash and recognizes expenses when it pays cash.

- **Recognition of Revenues:** To be recognized under U.S. GAAP, revenues must ordinarily satisfy two criteria:

- They must be earned-this involves the delivery of goods or services to a customer.
- They must be realized or realizable: when a company receives cash or claims (customer's promise to pay) to cash in exchange for goods or services.

- **Matching:** The recording of expenses in the same time period that we recognize the related revenues.

- **Accounting Time Period**
 - Fiscal year: The year established for accounting purposes, which may differ from the calendar year.
 - Interim periods: The time spans established for accounting purposes that are less than a year.
- **Double-Entry Accounting System**
 - Every transaction affects at least two accounts.
 - Accountants analyse each transaction to determine which accounts it affects, whether to increase or decrease the account balances, and how much each balance will change.
- **Debit:** An entry or balance on the left side of any account.
- **Credit:** An entry or balance on the right side of any account.

Basic Financial Statements

- The ***balance sheet***, or statement of financial position, portrays the financial position of the company by showing what the company owns and what it owes at the report date.
- The ***income statement*** or statement of financial performance reports on how the company performed and shows how much a firm earned in the period of analysis. The income statement is sometimes called a profit and loss statement.
- The ***statement of cash flows***, which reports on cash inflows and outflows to the firm during the period of analysis .

The Balance Sheet

- The balance sheet is a financial snapshot of the firm. The Balance sheet is always divided into two halves :
 1. Assets
 2. Liabilities and Owners' (Shareholders') Equity.
- The balance sheet provides the details of the accounting identity:
$$\text{Assets} = \text{Liabilities} + \text{Owners' equity}$$

Sample Balance Sheet

Assets = Liabilities + Shareholders' Equity

Assets

Current Assets

Cash

Marketable securities

Account receivable

Inventories

Total current assets

Long-term assets

Machinery and equipment

Buildings

Land

Total long-term assets

Other Assets

Investment in long-term securities

Trademarks, patents etc.

Total other assets

Total Assets

Liabilities and Equity

Current Liabilities

Account payable

Accrued expenses

Short-term notes

Total current liabilities

Long-term liabilities

Long-term notes

Mortgages

Total long-term liabilities

Equity

Preferred shares

Common shares

Retained earnings

Total equity

Total Liabilities and Equity

Assets

- Assets are divided into current and long-term assets.
- **Current Assets:** Current assets are either cash or assets that could be converted into cash within one year. This category includes the following:
 1. Cash and other marketable securities, which are short-term, low-risk investments that can be easily sold and converted to cash
 2. Accounts receivable, which are amounts owed to the firm by customers who have purchased goods or services on credit
 3. Inventories, which are composed of raw materials as well as work-in-progress and finished goods
 4. Other current assets that includes items such as prepaid expenses (such as rent or insurance paid in advance) etc.

- **Long-Term Assets**

1. Net property, plant, and equipment often referred to as fixed assets include assets such as real estate or machinery that produce tangible benefits for more than one year.
2. Intangible assets that the firm acquired through the acquisition (e.g., brand names and trademarks, patents, customer relationships, and employees).
3. Other long-term assets can include such items as property not used in business operations, startup costs in connection with a new business, investments in long-term securities, and property held for sale.

- **Depreciation:** The firm reduces the value of fixed assets (other than land) due to “wear and tear” from use and the passage of time. The depreciation schedule of a fixed asset depends on the asset’s estimated useful life.

Liabilities

- **Current Liabilities:** Liabilities that will be satisfied within one year are known as current liabilities. They include the following:
 1. Accounts payable, the amounts owed to suppliers for products or services purchased with credit.
 2. Short-term debt or notes payable, and current maturities of long-term debt, which are all repayments of debt that will occur within the next year.
 3. Items such as salary or taxes that are owed but have not yet been paid, and deferred or unearned revenue, which is revenue that has been received for products that have not yet been delivered.

- **Long-Term Liabilities:** Long-term liabilities are liabilities that extend beyond one year. We describe the main types as follows:
 1. Long-term debt is any loan or debt obligation with a maturity of more than a year. When a firm needs to raise funds to purchase an asset or make an investment, it may borrow those funds through a long-term loan. Bonds are examples of long-term debt.
 2. Capital leases are long-term lease contracts that obligate the firm to make regular lease payments in exchange for use of an asset.
 3. Deferred taxes are tax liabilities a company may postpone paying until some future time.

Stockholders' Equity

- The difference between the firm's assets and liabilities is the stockholders' equity; it is also called the **book value of equity**.
 - Book value is the real worth of the assets of the company.
 - The book value of equity is the difference between the book value of assets and the book value of liabilities.
 - Book value of an asset is accounted in the balance sheet based on historical cost, the actual cost or acquisition cost of the asset.
- Book value provides a relatively stable, intuitive measure of value that can be compared to the market price.
- Even firms with negative earnings, which cannot be valued using price-earnings ratios, can be evaluated using price-book value ratios.
- There are far fewer firms with negative book value than there are firms with negative earnings.

- The book value of equity is an inaccurate assessment of the actual value of the firm's equity. The problems with book value are:
 - Many of the assets are valued based on their historical cost rather than their true value today.
 - Many of the firm's valuable assets for examples the expertise of the firm's employees, the firm's reputation in the marketplace, the relationships with customers and suppliers, the value of future research and development innovations, and the quality of the management team are not captured on the balance sheet.
 - The book value of equity can be negative (liabilities exceed assets) not necessarily an indication of poor performance.

- **Par value:** The nominal or face value of a security assigned to it by its issuer.
- **Paid-in capital:** The total capital investment in corporation by its owners both at and subsequent to the inception of business.

Total paid-in capital= common stock or capital stock at Par + additional paid-in capital in excess of Par value

- **Security premium:** The excess of issue price over par value
- Payouts to common stock are dividends, in two forms:
 - **Cash dividends**
 - **Stock dividends**

- **Preferred Stock**

- Preferred stock is an equity ownership that has preference over common shares with regard to dividends and the distribution of assets in case of liquidation.
- Preferred stock provides limited shareholder rights and appreciation potential.

- **Retained Earnings**

- Retained earnings are the accumulated profits the company earn and reinvest or “retains” in the company.
- Retained earnings increases by the amount of profits earned, less dividends declared to shareholders.

Stockholders' Equity = Paid-in capital + Retained earnings

Retained earnings = Revenues - Expenses - Dividends

How transactions are recorded?

- Hector Lopez, a salaried employee of a local bicycle company, quits his job and opens his own bicycle shop, Biwheels Company, on January 2, 20X2.
- Lopez invests \$400,000 in the business. Then, acting for the business, he borrows \$100,000 from a local bank.
- **Transaction 1, initial investment**

	Assets	=	Liabilities	+	Owner's Equity
	Cash				Lopez, Capital
(1)	+400,000	=			+400,000
					(Owner investment)

- Transaction 2, loan from bank

	Assets	=	Liabilities	+	Owner's Equity
	Cash	=	Note Payable	+	Lopez, Capital
(1)	+400,000	=			+400,000
(2)	+100,000	=	+100,000		
Bal.	<u>500,000</u>	=	<u>100,000</u>		<u>400,000</u>
	<u>500,000</u>		<u>500,000</u>		

- Transaction 3, acquire store equipment for cash

	Assets		=	Liabilities	+	Owner's Equity
	Cash	+ Store Equipment	=	Note Payable	+	Lopez, Capital
Bal.	500,000		=	100,000		400,000
(3)	<u>-15,000</u>	<u>+15,000</u>	=			
Bal.	485,000	15,000	=	100,000		400,000
	<u>500,000</u>			<u>500,000</u>		

- **Balance Sheet**

Balance Sheet
January 3, 20X2

Assets		Liabilities and Owner's Equity	
Cash	\$485,000	Liabilities (Note payable)	\$100,000
Store equipment	<u>15,000</u>	Lopez, capital	<u>400,000</u>
Total assets	<u><u>\$500,000</u></u>	Total liabilities and owner's equity	<u><u>\$500,000</u></u>

The Income Statement

- The income statement shows the record of a company's operating results for the whole year.
- It serves as a valuable guide in anticipating how the company may do in the future.
- Whereas the balance sheet shows the firm's assets and liabilities at a given point in time, the income statement shows the flow of revenues and expenses generated by those assets and liabilities between two dates.

Sample Income Statement

Sales

- Cost of goods sold

Gross profit

- Selling expense
- Administrative expense
- Depreciation expense

Earnings Before Interest and Taxes(EBIT)

- Interest expense

Earnings Before Taxes

- Taxes

Net Income before Preferred Dividends

- Preferred share dividends

Net Income available to Common Shareholders

Transactions contd.

- Suppose Biwheels' sales for the entire month of January total \$160,000 on open account. Thus, the January sales increase Biwheels' Accounts Receivable account by \$160,000.
- The cost to Biwheels of the inventory sold is \$100,000. Delivering merchandise to customers reduces its Merchandise Inventory account by \$100,000.

	Assets		=	Liabilities	+	Stockholders' Equity
	Accounts Receivable	+ Merchandise Inventory				Retained Earnings
Sales on open account	+160,000		=			+160,000 (Sales Revenue)
Cost of merchandise inventory sold		-100,000	=			-100,000 (Cost of Goods Sold Expense)

- **Income Statement**

Sales revenue		\$160,000
Deduct expenses		
Cost of goods sold	\$100,000	
Rent	2,000	
Depreciation	<u>100</u>	
Total expenses		<u>102,100</u>
Net income		<u><u>\$ 57,900</u></u>

Earnings Calculations

- **Gross Profit or Gross Margin**
 - Gross Profit is the difference between sales revenues and the costs of the inventory that was sold.
- **Cost of sales or cost of goods sold (COGS)**
 - All the costs the company incurs to purchase and convert raw materials into the finished products that it sells. These costs are commonly known as product costs.
- **Operating Expenses**
 - These are expenses from the ordinary course of running the business that are not directly related to producing the goods or services being sold.

- **Depreciation:** The firm reduces the value of fixed assets (other than land) due to “wear and tear” from use and the passage of time. The depreciation schedule of a fixed asset depends on the asset’s estimated useful life.
- Depreciation expense is reported on **the income statement** as any other normal business expense.
- **Operating income**
 - The firm’s gross profit net of operating expenses is called operating income
- **EBIT:** Earnings Before Interest and Taxes

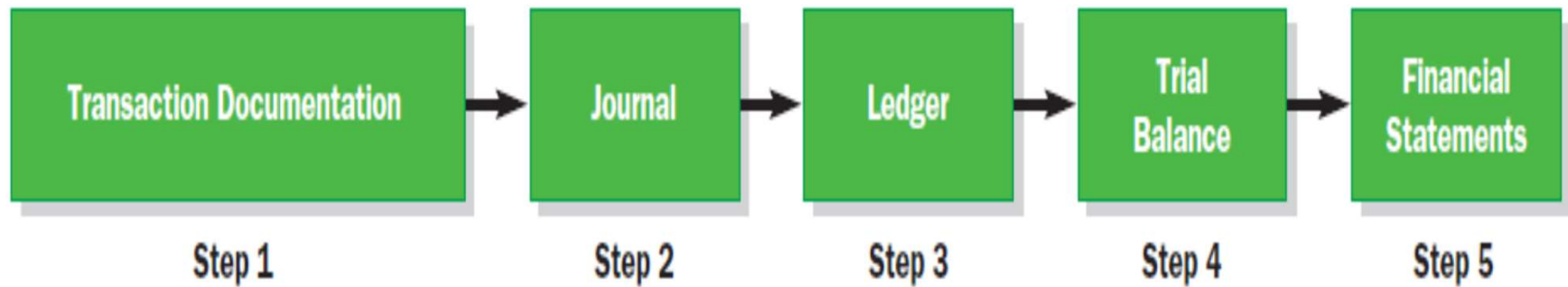
- **Net Income and EPS**

- Net income represents the total earnings of the firm's equity holders. It is often reported on a per-share basis as the firm's earnings per share (EPS), which we compute by dividing net income by the total number of shares outstanding

$$\text{EPS} = \frac{\text{Net Income}}{\text{Average number of common shares outstanding}}$$

- The number of shares outstanding may grow:
 - When the company issues new stock to compensates its employees or executives with stock options.
 - When the firm issues convertible bonds, a form of debt that can be converted to shares.
- This growth in the number of shares will cause dilution or reduction of the EPS is known as **diluted EPS**.

Recording Transactions



General Journal Entry

Date	Entry No.	Accounts and Explanation	Post Ref.	Debit	Credit
20X2	4	Merchandise inventory Cash Acquired inventory for cash	130 100	120,000	120,000
	5	Merchandise inventory Accounts payable Acquired inventory on credit	130 203	10,000	10,000
	6	Merchandise inventory Cash Accounts payable Acquired merchandise inventory for cash plus credit (This is an example of a <i>compound journal entry</i> whereby more than two accounts are affected by the same transaction)	130 100 203	30,000	10,000 20,000
	7	Cash Store equipment Sold store equipment to business neighbor	100 170	1,000	1,000
	8	Accounts payable Merchandise inventory Returned some inventory to supplier	203 130	800	800
	9	Accounts payable Cash Payments to creditors	203 100	4,000	4,000
	10a	Accounts receivable Sales revenue Sales to customers on credit	120 500	160,000	160,000
	10b	Cost of goods sold Merchandise inventory To record the cost of inventory sold	600 130	100,000	100,000
	11	Cash Accounts receivable Collections from debtors	100 120	5,000	5,000
	12	Prepaid rent Cash Payment of rent in advance	140 100	6,000	6,000

General Ledger

Assets				=	Liabilities + Stockholders' Equity							
(Increases on left, decreases on right)					(Decreases on left, increases on right)							
Cash		Account No. 100			Note Payable		202		Paid-in Capital		300	
(1)	400,000	(3)	15,000			(2)	100,000			(1)	400,000	
(2)	100,000	(4)	120,000									
(7)	1,000	(6)	10,000									
(11)	5,000	(9)	4,000									
		(12)	6,000									
1/31 Bal. 351,000												
Accounts Receivable		120			Accounts Payable		203		Retained Earnings		400	
(10a)	160,000	(11)	5,000		(8)	800	(5)	10,000			1/31 Bal.	57,900*
					(9)	4,000	(6)	20,000				
1/31 Bal. 155,000						1/31 Bal.	25,200					
					Expense and Revenue Accounts							
Merchandise Inventory		130			Cost of Goods Sold		600		Sales Revenues		500	
(4)	120,000	(8)	800		(10b)	100,000				(10a)	160,000	
(5)	10,000	(10b)	100,000									
(6)	30,000											
1/31 Bal. 59,200												
Prepaid Rent		140			Rent Expense		601					
(12)	6,000	(13)	2,000		(13)	2,000						
1/31 Bal. 4,000					Depreciation Expense		602					
Store Equipment		170			(14)	100						
(3)	15,000	(7)	1,000									
1/31 Bal. 14,000												
Accumulated Depreciation, Store Equipment		170A										
(14)			100									

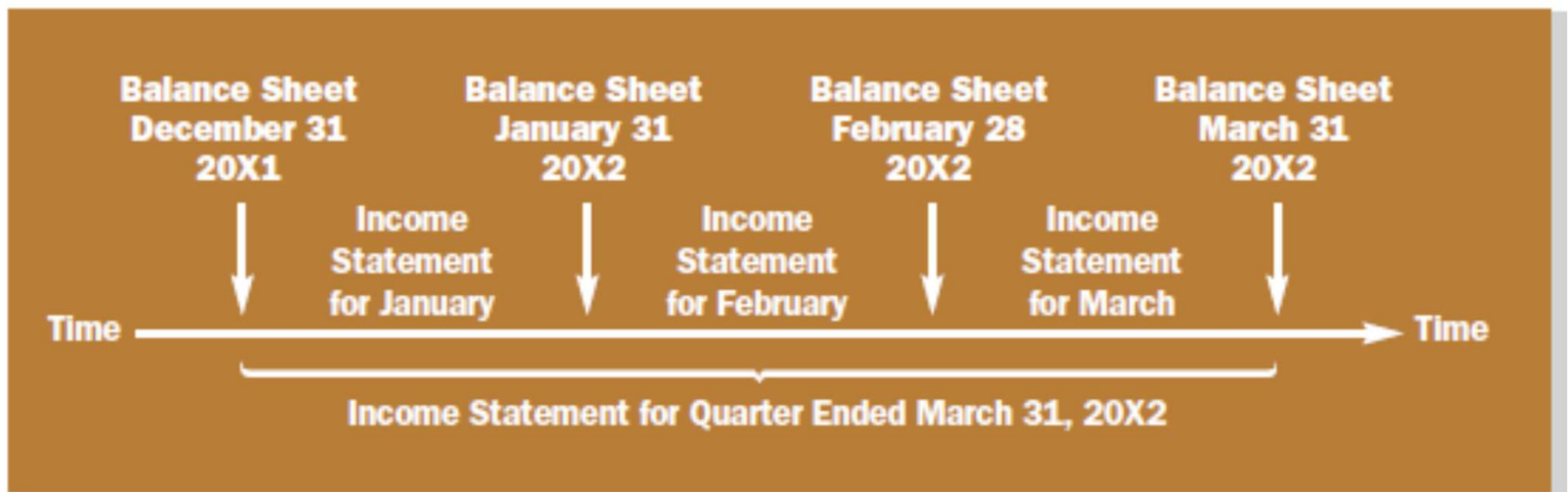
Trial Balance

	Debits	Credits
Cash	\$ 351,000	
Accounts receivable	155,000	
Merchandise inventory	59,200	
Prepaid rent	4,000	
Store equipment	14,000	
Accumulated depreciation, store equipment		\$ 100
Note payable		100,000
Accounts payable		25,200
Paid-in capital		400,000
Retained earnings		0*
Sales revenue		160,000
Cost of goods sold	100,000	
Rent expense	2,000	
Depreciation expense	100	
Total	<u>\$685,300</u>	<u>\$685,300</u>

Trial Balance, Balance Sheet, Income Statement

Trial Balance, January 31, 20X2			Balance Sheet, January 31, 20X2			
	Debits	Credits	Assets		Liabilities and Stockholders' Equity	
Cash	\$351,000		Cash	\$351,000	Liabilities	
Accounts receivable	155,000		Accounts receivable	155,000	Note payable	\$100,000
Merchandise inventory	59,200		Merchandise inventory	59,200	Accounts payable	25,200
Prepaid rent	4,000		Prepaid rent	4,000	Total liabilities	\$125,200
Store equipment	14,000		Store equipment	14,000	Stockholders' equity	
Accumulated depreciation, store equipment		\$ 100	Less: Accumulated depreciation	100	Paid-in capital	\$400,000
Note payable		100,000		13,900	Retained earnings	57,900
Accounts payable		25,200	Total assets	<u>\$583,100</u>	Total stockholders' equity	457,900
Paid-in capital		400,000			Total liabilities and stockholders' equity	<u>\$583,100</u>
Retained earnings		0*				
Sales revenue		160,000				
Cost of goods sold	100,000					
Rent expense	2,000					
Depreciation expense	100					
Total	<u>\$685,300</u>	<u>\$685,300</u>				
*If there were a beginning balance in Retained Earnings, this balance would be added to the \$57,900 from the income statement to compute Retained Earnings on the balance sheet.			Income Statement, for the Month Ended January 31, 20X2			
			Sales revenue		\$160,000	
			Deduct expenses			
			Cost of goods sold	\$100,000		
			Rent	2,000		
			Depreciation	100		
			Total expenses		<u>102,100</u>	
			Net income		<u>\$ 57,900</u>	

Relationship Between the Income Statement and Balance Sheet



The Statement of Cash Flows

- Cash flow is a company's lifeblood, and for a healthy company the primary source of cash flow is earnings.
- The cash flow statement reports where a company generated cash and where cash was used over a specific accounting period.
- Security analysts determine cash flow to predicts stock price movements.
- The cash flow statement assigns all cash flows to one of three categories:
 - operating cash flows
 - investment cash flows, and
 - financing cash flows

Sample Statement of Cash Flows

Cash Flow from Operations

Net profit after taxes
+ Depreciation
+ Decrease in accounts receivable
+ Decrease in inventories
+ Increase in accounts payable
+ Decrease in accruals
Cash provided by operations

Cash Flow from Investments

Increase in fixed assets
Change in business ownership
Cash provided by investment activities

Cash Flow from Financing Activities

+ Decrease in notes payable
+ Increase in long-term debt
+ Changes in shareholders' equity
- Dividends paid
Cash provided by financing activities

Net increase/decrease in cash and marketable securities

- Operating cash flow: Cash generated by a firm's normal business operations.
- Investment cash flow: Cash flow resulting from purchases and sales of fixed assets and investments.
- Financing cash flow: Cash flow originating from the issuance or repurchase of securities and the payment of dividends.
- **The sum of operating cash flow, investment cash flow, and financing cash flow yields the net change in the firm's cash.**
- This change is the "bottom line" of the cash flow statement and reveals how much cash flowed into or out of the company's cash account during an accounting period.

Statement of Stockholders' Equity

- The statement of stockholders' equity focus on the performance over a period of time.
- It shows all changes during the year in each stockholders' equity account.

	Paid-in Capital	Retained Earnings
Beginning balance, January 31, 20X2	\$400,000	\$57,900
Net income for February		63,900
Dividends declared		(50,000)
Ending balance, February 28, 20X2	<u>\$400,000</u>	<u>\$71,800</u>

Analyzing Financial Statements: Different Approaches

- Ratio analysis
 - The process of examining various financial statement items with the objective of assessing the success of past and current performance and, perhaps more importantly, of projecting future performance and financial condition.
- Analysis Approach
 - Comparisons across time
 - Trend and time-series analysis
 - Cross-Sectional Analysis
 - Within industry
 - Across sectors

Analyzing Financial Statements: Analysis Techniques

- **Vertical and horizontal analysis:**
- Vertical analysis focuses on the relationships among financial statement items at a given point in time.
- A common-size financial statement is a vertical analysis in which each financial statement item is expressed as a percentage.
- In income statements, all items are usually expressed as a percentage of sales.
- In balance sheets, all items are usually expressed as a percentage of total assets.
- Common-size financial statements are particularly useful when comparing data from different companies.

Common size balance sheet

ABC Company Balance Sheet		
	Amount	Percent
Assets		
Current Assets		
Cash	\$14,500	14.5%
Accounts Receivable	18,000	18.0%
Inventory	12,000	12.0%
Prepaid Expenses	500	0.5%
Total Current Assets	\$45,000	45.0%
Non-current Assets		
Property, Plant & Equipment	52,000	52.0%
Goodwill	3,000	3.0%
Total Assets	\$100,000	100.0%
Liabilities and Shareholder's Equity		
Current Liabilities		
Accounts Payable	\$15,000	15.0%
Salaries Payable	10,000	10.0%
Accrued Expenses	5,000	5.0%
Total Current Liabilities	\$30,000	30.0%
Long-term Debt	30,000	30.0%
Shareholder's Equity	40,000	40.0%
Total Liabilities and Shareholder's Equity	\$100,000	100.0%

Common size income statement

ABC Company Income Statement		
	Amount	Percent
Revenue	\$100,000	100.0%
Cost of Goods Sold	70,000	70.0%
Gross Profit	\$30,000	30.0%
Research & Development	10,000	10.0%
Advertising	3,000	3.0%
General & Administrative	2,000	2.0%
Operating Income	\$15,000	15.0%
Interest Expense	2,000	2.0%
Earnings Before Taxes	\$13,000	13.0%
Taxes	3,000	3.0%
Net Income	\$10,000	10.0%

- Horizontal analysis (trend analysis) shows the changes between years in the financial data in both dollar and percentage form.
- Year-to-year growth analysis
- Horizontal analysis refers to the process of reading current financial data in comparison to previous reporting periods.
- Horizontal analysis is used to identify trends over time, vertical analysis is used to determine how individual line items in a statement relate to another item in the report.

- **Ratio analysis**
 - Enables inter-temporal and cross-sectional comparisons
 - Our primary focus
- An item on a financial statement has little meaning by itself. The meaning of the numbers can be enhanced by drawing comparisons
- Analysts should look beyond the ratios.
- In addition to ratios, other sources of data should also be considered such as industry trends, technological changes, changes in consumer tastes, changes in broad economic factors, and changes within the company itself.
- Other measures are market value added and economic value added measure in dollars.

Ratio Analysis

- Ratios assess business financial performance and condition
- Analyse trends over time for the business
- Compare ratios for similar firms and industry average
- Four categories of ratios:
 - Short term liquidity and cash needs (**Liquidity ratio**)
 - Profits and operating results (**Profitability ratio**)
 - Efficiency or changes in certain assets (**Turnover ratio**)
 - Capital structure and debt service capacity (**Leverage ratio**)
 - Market price and dividend ratios

Liquidity Ratios

- These ratios focus on a company's ability to pay bills when due.
- Creditors often compare a firm's current assets and current liabilities to assess whether the firm has sufficient working capital to meet its short-term needs.
- If liquidity ratio remains high for a prolonged period, too much capital may be invested in liquid assets (e.g., short-term investments, accounts receivable, inventory) and too little devoted to increasing shareholder-value.

Short-Term Liquidity

- **Current Ratio**

- The current ratio measures a company's ability to meet short-term obligations if sales cease.

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

- A higher current ratio implies less risk of the firm experiencing a cash shortfall in the near future. An unusual increase in inventory could be an indicator that the firm is having difficulty selling its products.
- Depending on the industry, current ratio of 2 or greater is preferable. If the ratio is less than 1, a company could have trouble meeting current obligations if sales declines.

- **Quick Ratio (or Acid Test Ratio)**

- The quick ratio is similar to the current ratio; however, inventories are excluded from current assets because inventories can become overvalued within a short time frame.

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

$$\text{Quick Ratio} = \frac{\text{Cash} + \text{Marketable Securities} + \text{Account Receivables}}{\text{Current Liabilities}}$$

- An unusual increase in inventory could be an indicator that the firm is having difficulty selling its products.
- Depending on the industry, a quick ratio of 1 or greater is preferable. If the ratio is less than 1, it could be difficult for a company to pay short-term obligations if sales drop.

Turnover Ratios

- Efficiency or turnover ratio measure activity or changes in certain assets.
- Poor turnover generally indicates resources are invested in non-income producing assets.
- The account receivable (A/R) turnover ratio measure how quickly a company collects on sales. For example, an A/R turnover ratio of 6 means receivables are paid every 2 months. A low A/R turnover ratio could indicate a company has uncollectible receivables.

- **Accounts receivable turnover**

- Measures the ability to control receivables. This ratio indicates how rapidly collection occur.

$$\text{Accounts receivable turnover} = \frac{\text{Credit Sales}}{\text{Average accounts receivable}}$$

- If the turnover were 12, it would indicate that a receivables are collected after 1 month on average. Higher turnovers indicate that a company collects its receivables quickly.

- The **accounts receivables days**, or **average collection period** measure the number of days firm takes to collect payment from its customers.
 - Significant unexplained increase could be a cause for concern indicating the firm is doing a poor job collecting from its customers or is trying to boost sales by offering generous credit terms.

Accounts receivables days = $365 / \text{Accounts receivable turnover}$

- **Inventory turnover**

- The inventory turnover ratio measures how quickly inventory is sold and replaced each year.
- How much inventory should a company have in hand? That depends on combination of many factors including the type of business and the time of the year.
- An automobile dealer with a large stock of autos at the peak season is in a store position; yet that same inventory at the end of the season represents a weakness in the dealer's financial condition.

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

- The numerator is cost of goods sold instead of sale because inventory is valued at cost.
- An inventory turnover of 12 means inventory is sold (turned over) once each month.
- A low inventory turnover ratio could mean there is a lack of demands for a business's products and/or inventories may be (become) overvalued.

- Managers sometimes also look at how many days' sales are represented by inventories.
- This says that on average the firm has sufficient inventories to maintain sales for how many days.

$$\text{Days' sales in inventories} = \frac{365}{\text{Inventory turnover}}$$

- **Asset turnover**

- It indicates the efficiency of the firm's use of assets in the sense that it measures the annual sales generated by each dollar of assets.
- Higher the ratio better the asset utilisation.

$$\text{Total asset turnover} = \frac{\text{Sales}}{\text{Average total assets}}$$

Profitability Ratios

- Profitability ratios assess a firm's operating performance
- These ratios vary from industry to industry, and should be compared to a company's ratios for prior years/periods.
- **Gross Margin**
 - A firm's gross margin reflects its ability to sell a product for more than the cost of producing it.

$$\text{Gross Margin} = \frac{\text{Gross Profit}}{\text{Sales}}$$

- **Operating Margin**
 - The operating margin reveals how much a company earns before interest and taxes from each dollar of sales.

$$\text{Operating Margin} = \frac{\text{Operating Income}}{\text{Sales}}$$

where, Operating income = Total sales – Cost of goods sold (COGS) – Operating expenses.

Operating income is also known as **EBIT (earnings before interest and taxes)**

- **Operating leverage:**

$$\text{EBIT} = \text{Revenue (Sales)} - \text{COGS} - \text{Operating Expenses}$$

Or, $\text{EBIT} = \text{Net Income} + \text{Interest} + \text{Taxes}$

$$\text{EBIT to Sales} = \frac{\text{EBIT}}{\text{Sales}}$$

EBIT to Sales is a variation of return on sales.

- **Return on Sales or Net Profit Margin**

- The net profit margin shows the fraction of each dollar in revenues that is available to equity holders after the firm pays interest and taxes.
- This ratio gauges a company's ability to control the level of all its expenses relative to its sales.

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

- **Return on Common stockholders' equity ratio (ROE or ROCE)**
 - ROE measures the return to common shareholders after accounting for the cost of debt and (preferred) equity financing.
 - The return on equity ratio measures a company's return on investors' money.

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average Common Stockholders' Equity}}$$

- The ROE provides a measure of the return that firm has earned on its past investments.
- A high ROE may indicate the firm is able to find investment opportunities that are very profitable.
- It is a measure of overall accomplishment from the perspective of the shareholders.

- **Return on assets (ROA)**

- The objective is to assess how successful a firm's operating performance has been (i.e., how successful has the firm been at generating profits?).
- Measures a firm's success in using assets to generate earnings, independent of the financing of those assets (i.e., debt versus equity).

$$\text{Pre-tax ROA} = \frac{\text{EBIT}}{\text{Average Total Assets}}$$

$$\text{After-tax ROA} = \frac{\text{Net Income} + (1-\tau) \text{Interest Expenses}}{\text{Average Total Assets}}$$

where τ = tax rate

- The numerator is operating income after income taxes, excluding any financing costs.

- The return on sales considers profit as a percentage of sales.
- A low return on sales ratio can mean sales price are too low and/or operating costs are too high.
- **EBITDA**
 - EBITDA is firm's earnings before interest, taxes, depreciation, and amortization.
 - Because depreciation and amortization are not cash expenses for the firm, EBITDA is a rough measure of the cash a firm has "earned" from its operations.

Leverage Ratios

- These ratios consider a company's use of borrowed funds (rather than stockholder's equity or investments) to expand its business.
- The goal is to borrow funds at a low interest rate and invest in a business activity that produces a rate of return exceeding the target rate of return for investment.
- A stock is said to be highly leveraged this simply means is that the company issuing the stock has a large proportion of bonds and preferred stock outstanding relative to the amount of common stock.

- **Debt-Equity Ratio**

- The debt to equity ratio measures the long term solvency of a company by comparing debt to net worth.
- A company with a high debt to equity ratio could have trouble meeting fixed interest/debt payments if business falters or does not grow as planned.
- A firm's market debt- equity ratio has important consequences for the risk and return of its stock.

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

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

- **Long-Term Solvency Ratios**

- Measure firm's ability to meet interest & principal payments on long-term debt when they come due.

$$\text{Long-Term Debt Ratio} = \frac{\text{Long-Term Debt}}{\text{Long-Term Debt} + \text{Shareholder's Equity}}$$

- Leverage: The degree to which a company uses borrowed funds instead of invested funds

$$\text{Financial leverage ratio} = \frac{\text{Average total assets}}{\text{Average common stockholder's Equity}}$$

- **Interest coverage ratio (Times Interest Earned Ratio)**

- Lenders often assess a firm's leverage by comparing its income or earnings with its interest expenses using an interest coverage ratio.
- When this ratio is high, it indicates that the firm is earning much more than is necessary to meet its required interest payments.

$$\text{Interest coverage ratio} = \frac{\text{EBIT}}{\text{Interest expense}}$$

- The interest coverage ratio measures a company's ability to make interest payment on debt.
- If the ratio does not exceed the interest rate on current debt, the business may not making enough to pay interest expense.

The DuPont Identity

- We can analyze the determinants of a firm's ROE using a tool called the DuPont Identity, named for the company that popularized its use, which expresses the ROE in terms of the firm's profitability, asset efficiency, and leverage.

$$\text{ROE} = \left(\frac{\text{Net Income}}{\text{Sales}} \right) \times \left(\frac{\text{Sales}}{\text{Total Assets}} \right) \times \left(\frac{\text{Total Assets}}{\text{Book Value of Equity}} \right)$$

$$= \text{Net Profit Margin} \times \text{Asset Turnover} \times \text{Leverage}$$

$$= \text{Return on Assets} \times \text{Leverage}$$

- The third term leverage or equity multiplier, which indicates the value of assets held per dollar of shareholder equity.
- The equity multiplier will be higher the greater the firm's reliance on debt financing.

Market price and dividend ratios

- **Market Value**

- Market value is defined as the maximum price at which an asset or security can be bought or sold in the market.
- Market value is the projected value of the firms or the assets worth in the market. The market value of a stock depends on what investors expect those assets to produce in the future.
- Market value changes every single moment.
- Market value reflects the fair value or market value of an asset.
- The market value of a company referred to as the company's market capitalization is calculated by multiplying the market price per share of the company with the number of outstanding shares.

- **Price Earnings Ratio (P/E)**

$$\text{P/E Ratio} = \frac{\text{Market Price}}{\text{Earning per Share}}$$

- P/E ratios can vary widely across industries and tend to be higher for industries with higher expected growth rates.
- A high P/E ratio (compared to the industry) can mean (1) investors are paying more for a company because they expect good future earnings and growth in stock value, or (2) the stock is overpriced and may be heading for a decline.
- A low P/E ratio (compared to the industry) could mean (1) the stock is undervalued and is likely to increase in value, or (2) the company is in some financial trouble and is not expected to recover in near future.
- The P/E ratio is not meaningful when the firm's earnings are negative. In this case, it is common to look at the firm's enterprise value relative to sales.

- **Book Value per Share**

- Book value per share of common stock can be thought of as the amount of money each share would receive if the company were liquidated.

$$\text{Book value per share} = \frac{\text{Stockholders' Equity} - \text{Preferred Stock(if any)}}{\text{Average number of shares outstanding}}$$

- **Price to book ratio:**

- The book value of a company is the difference between that company's total assets and total liabilities, and not its share price in the market.

$$\text{P/B Ratio} = \frac{\text{Market Price per share}}{\text{Book value of equity per share}}$$

- **Market-to-Book Ratio**

- The **market-to-book ratio** (also called the **price-to-book [P/B] ratio**) is the ratio of its market capitalization to the book value of stockholders' equity.

$$\text{Market-to-Book Ratio} = \frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$$

- Analysts often classify firms with low market-to-book ratios as **value stocks**, and those with high market-to-book ratios as **growth stocks**.

- **Dividend-yield**

- Individual investors are usually interested in the profitability of their personal investments in common stocks.
- The profitability takes two forms: cash dividends and market- price appreciation of the stock.
- Investors in common stock who seeks regular cash returns on their investments pay attention to dividend ratios.
- Growth companies have conservative dividend policies because they use most of their profits to help finance expansion of their operations.

$$\text{Dividend-yield} = \frac{\text{Common dividend per share}}{\text{Market price per share}}$$

- **Dividend-payout**

- Analysts are also interested in what proportion of net income a company decides to pay in cash dividends to its shareholders.

$$\text{Dividend-payout} = \frac{\text{Common dividend per share}}{\text{Earnings per share}}$$

Economic Value Added (EVA)

- Economic Value Added (EVA) is a measure of surplus value created on an investment.
- Managers often compare the company's return on assets with the cost of capital, to see whether the firm is earning the return that investors require.

$$\text{EVA} = (\text{Return on Capital} - \text{Cost of Capital}) * \text{Capital Invested in the firm}$$

- A value is created when the return on the firm's economic capital employed is greater than the cost of that capital.
- EVA is net operating profit after taxes (or NOPAT) less a capital charge, the latter being the product of the cost of capital and the economic capital.
$$\text{EVA} = \text{NOPAT} - \text{Cost of capital} * \text{Capital invested in the firm}$$

Market Value Added (MVA)

- Market value added is the excess of the market value of equity over its book value.
- If the total market value of a company is more than the amount of capital invested in it, the company has created value.

$$\text{MVA} = \text{Company's total Market Value} - \text{Capital Invested in the firm}$$

- Market value of the firm includes the value of the firm's equity and debt. With the simplifying assumption that market and book value of debt are equal,

$$\text{MVA} = \text{Market Value of equity} - \text{Book value of equity}$$

Market Efficiency and Financial Statement Analysis

- Implications of stock market efficiency:
 - Many profit-maximizing, actively competing traders
 - Information almost freely available to all participants
 - Competition means that the full effects of new information on intrinsic values are reflected instantaneously in prices
 - Stock prices rapidly adjust to new information such that the new price promises only a normal rate of return to an investor
- If markets are efficient, then what's the use of "Fundamental Analysis" and Valuation?

Conflicting evidence on market efficiency

– Markets are Efficient:

- Market's reaction to news events is instantaneous.
- Mutual funds have on average been unable to outperform broad indexes; in fact, generally under-performed.
- Why publish “secrets” instead of making money yourself?.

– Markets are Inefficient:

- Growing evidence of “easy ways” to beat market.
- Greater acceptance of “Behavioural Explanations” for stock market fluctuations.

Example

- Balance Sheet of XYZ Ltd. & ABC Ltd.

Assets	XYZ	ABC
Fixed Assets	200,000	300,000
Other Non Current Assets	50,000	75,000
Current Assets		
Account Receivables	100,000	200,000
Inventory	50,000	100,000
Cash	50,000	50,000
Total	450,000	725,000
Liabilities		
Capital	200,000	300,000
Long Term Debt	100,000	225,000
Current Liabilities		
Account Payables	100,000	100,000
Other Current Liabilities	50,000	100,000
Total	450,000	725,000

- P&L Statement of XYZ Ltd. & ABC Ltd.

Particulars	XYZ	ABC
Sales	200,000	300,000
Less: Cost of Goods sold (including purchases)	100,000 (50,000)	150,000 (75,000)
Gross Profit	1,00,000	1,50,000
Less: Selling & Distribution Expenses	30,000	50,000
Less: Depreciation	10,000	10,000
Earning before Interest & Tax	60,000	90,000
Less: Interest	10,000	20,000
Earning before Tax	50,000	70,000
Less: Taxes	20,000	28,000
Earning after Tax	30,000	42,000

1. Liquidity Ratios

a) Current Ratio

Current Ratio = Current Assets/Current Liabilities

Particulars	XYZ	ABC
Current Assets	200,000	350,000
Current Liabilities	150,000	200,000
Current Ratio	1.33	1.75

ABC's Current Ratio is better as compared to XYZ, which shows ABC is in a better position to repay its current obligations.

b) Quick Ratio

Quick Ratio = (Current Assets – Inventory)/Current Liabilities.

Particulars	XYZ	ABC
Quick Assets	150,000	300,000
Current Liabilities	150,000	200,000
Quick Ratio	1	1.5

ABC is in a better position as compared to XYZ to instantly cover its current obligations.

2. Profitability Ratios

a) Operating Profitability Ratio

EBIT to Sales = Earnings Before Interest & Tax (EBIT)/Sales

Particulars	XYZ	ABC
Operating Profit	60,000	90,000
Net Sales	200000	300000
Operating Profit Ratio	30%	30%

Both companies have a similar operating ratio.

b) Net Profit Ratio

Net Profit Margin = Net Profit/Sales.

Particulars	XYZ	ABC
Net Profit	30,000	42,000
Net Sales	200,000	300,000
Net Profit Ratio	15%	14%

XYZ has better profitability compared to ABC.

c) Return on Equity (ROE)

Return on Equity = Net Profit/Shareholders' Equity

Particulars	XYZ	ABC
Net Profit	30,000	42,000
Equity	200,000	300,000
Return on Equity	15%	14%

3. Turnover Ratios

a) Inventory Turnover Ratio

Inventory Turnover Ratio = Cost of Goods Sold/Average Inventory.

Particulars	XYZ	ABC
COGS	100,000	150,000
Average Inventory	50,000	100,000
Inventory Turnover Ratio	2.00	1.50

A higher ratio means a company is selling goods very quickly and is managing its inventory level effectively.

b) Receivable Turnover Ratios

Receivable Turnover Ratio = Credit Sales/Average Receivables.

Particulars	XYZ	ABC
Credit Sales	200,000	300,000
Average Receivables	100,000	200,000
Receivable Turnover Ratio	2.00	1.50

A higher ratio means the company is collecting its debt more quickly and managing its account receivables effectively.

4. Solvency Ratios

a) Debt Equity Ratio

Debt Equity Ratio= Total Debt/Total Equity

Particulars	XYZ	ABC
Debt	100,000	225,000
Equity	200,000	300,000
Debt Equity Ratio	0.50	0.75

A higher ratio means higher leverage. XYZ is in a better solvency position as compared to ABC.

b) Financial Leverage

Financial Leverage = Total Assets/Equity

Particulars	XYZ	ABC
Total Assets	450,000	725,000
Equity	200,000	300,000
Financial Leverage	2.25	2.42

Higher the ratio of ABC implies that the company is highly leveraged and could face difficulty in paying off its debt as compared to XYZ.