Level I

Financial Reporting and Analysis

FinQuiz Notes 2021

Book 3

FinQuiz
CFA PROGRAM EXAM PREP

1. INTRODUCTION

Income statement (a.k.a. "Statement of Operations", Statement of earnings, Statement of Profit & Loss): This statement represents company's profitability *over a period of time*. It shows the amount of revenue, expenses and resulting net income or loss for a company during a period of time.

- Equity analysts use Income Statement to evaluate companies' earnings and earnings growth rate. High (low) earnings growth companies receive above (below) average valuations.
- Fixed income analysts use Income Statement to evaluate companies' abilities to satisfy debt obligations.

Under both IFRS and U.S. GAAP, there are two ways to present Income Statement:

1) Income statement can be presented as a separate statement followed by a statement of Comprehensive Income that starts with the profit or loss from the income statement.
2) Income statement can be presented as a section of a single statement of Comprehensive Income.

Income Statement Format

Sales (or revenue)	$XXX
Cost of goods sold	XXX
Gross profit	XXX
Operating expenses	XXX
Operating income	XXX
Other income(expense)	XXX
Income before income tax	XXX
Income tax	XXX
Income from continuing operations	XXX
Discontinued operations (net)	XXX
Extraordinary items (net)	XXX
Net income	XXX
EPS:	
Income from continuing operations	$XXX
Discontinued operations (net)	XXX
Extraordinary items (net)	XXX
Net income	$XXX

2. COMPONENTS AND FORMAT OF THE INCOME STATEMENT

Components of Income Statement include:

Revenues: Amount charged for the delivery of goods or services in ordinary business activities of the company.

- It includes sales of goods & service.
- Revenue is also referred to as sales or turnover.

Net Revenue: It refers to revenue adjusted for cash or volume discounts or for estimated returns.

Expenses: Expenses represent outflows associated with main business activities of a company. They include:

- Cost of Goods Sold,
- Selling and Administrative expenses,
- Depreciation,
- Interest and Tax Expenses

Other Income & Expenses i.e. Gains & Losses

Gains/*losses*

- represent inflows/outflows from company's secondary activities e.g. sale of an office building for a manufacturing firm.

Details on gains & losses is typically available in the company's disclosures.

Net Income: It is reported at the bottom of Income statement. It is also referred to as "Net earnings" or "Profit or Loss" or "Bottom Line".

Firm with Controlling Interest in Subsidiary: Companies also report amount of net income attributed to the company itself and amount of net income attributed to minority interests or non-controlling interests.

- **Minority Interest:** It represents the pro-rata share of the subsidiary's income that the firm does not own. It is subtracted from parent's net income.
- **Consolidation:** Consolidation means that all of the revenues and expenses (excluding intercompany transactions) of the subsidiaries are included by a parent company in its Income Statement even if it owns < 100%.

Net Income = Income – Expenses

Net Income = (Revenue + Other Income + Gains) – Expenses

Net Income = (Revenue + Other Income + Gains) – (Expenses in the ordinary activities of the business + Other Expenses + Losses)

Net Income = (Revenue – Expenses in the ordinary activities of the business) + (Other Income – Other Expenses) + (Gains – Losses)

Differences in presentation of Income Statement include:

1) Different ordering of chronological information i.e. lists the years in increasing order from left to

right or lists the years in decreasing order with the most recent year listed in the left-most column.
2) Different presentations of items i.e. expenses can be grouped and reported as a single line item or may be reported separately.
- Revenues, finance costs, and tax expenses must be presented separately on the Income Statement.
- Under IFRS, line items, headings and subtotals that are relevant to understand the entity's financial performance should be presented even if it is not explicitly specified.

Presentation of Expenses: Expenses can be grouped
1) *According to their Nature* i.e. reporting depreciation on manufacturing equipment and depreciation on administrative facilities in a single line item i.e. "Depreciation".

2) According to their Function i.e. grouping expenses e.g. material & labor costs, depreciation or other costs directly related to sales into a single category i.e. Cost of Goods Sold.

Subtotals:
1. **Gross Profit or Gross Margin:** It is equal to Revenue – Cost of Sales. It represents the amount of revenue available to a company after deducting the costs of delivering goods/services. Expenses that are not directly related to sales are deducted after gross profit.

2. **Operating Profit or Operating Income:** It represents the company's profit generated from its usual business activities before subtracting taxes.

Operating Profit = Gross profit–Operating expenses
Operating Profit = Gross profit –Selling, General, Administrative and R&D expenses

- For Non-financial companies, Operating profit represents the company's profit generated from its usual business activities before subtracting interest & tax expense
- For financial companies, interest expense represents operating expense and is used to calculate operating profit.
- Operating profit helps analysts to evaluate performance of *individual business segments.*

EBIT (Earnings before Interest and Taxes): Operating profit is sometimes referred to as EBIT. However, EBIT and Operating profit are not necessarily the same.

NOTE:
Methods to calculate gross and operating profit vary among companies. Information regarding these methods and other variations across statements can be obtained from notes to financial statements.

Types of Format of Income Statement:

1. Multi-Step Format of Income Statement:
In a multi-step format, income statement exhibits a gross profit subtotal.

Purpose of Multi-Step Format: To separate permanent items from transitory items.

Advantage of Multi-Step Format: It facilitates analysts to have an accurate prediction of future earnings and future cash-flows.

2. Single-Step Format of Income Statement
In a single-step format, income statement does not exhibit a gross profit subtotal separately. In this format all revenues are grouped together, and all expenses are grouped together.

An analyst should be aware of the differences and adjustments made in revenue and expenses and should refer to the notes and disclosures to identify appropriate comparable amounts when comparing financial statements of different companies.

3. REVENUE RECOGNITION

Accounting standards for revenue recognition are almost identical under IFRS and US GAAP.

3.1 General Principles

The significance of revenue recognition is important because revenue is recognized when it is realized and earned, independent of the cash.

Under the accrual method of accounting→ Revenue is recognized when earned i.e. when risk and reward of ownership is transferred, and expenses are recognized when incurred.

For example,
When delivery is on credit ⇒ an asset is created (such as trade or account receivable)
When the company receives cash later ⇒ cash ↑, and account receivable ↓

Similarly,
When company receives cash in advance ⇒ a liability is created (such as unearned revenue). The company recognize revenue later when products/services are delivered.

3.2 Accounting Standards for Revenue Recognition

Converged standards (issued by IASB and FASB in May 2014), highlight principles-based approach to revenue recognition.

In this regard, the converged standard describes the application of following five steps in recognizing revenue:

1. **Identify the contract(s) with a customer**

2. **Identify the performance obligations in the contract:** The performance obligations within a contract represent promises to transfer distinct good(s) or service(s).

   - A good or service is distinct if the customer can benefit from it on its own or in combination with readily available resources and if the promise to transfer it can be separated from other promises in the contract.
   - Each identified performance obligation is accounted for separately.

3. **Determine the transaction price:** Transaction price is the price expected to be received by the seller in exchange for transferring the good (s) or services (s) identified in the contract.

4. **Allocate the transaction price to the performance obligations in the contract:** The transaction price is then allocated to each identified performance obligation.

5. **Recognize revenue when (or as) the entity satisfies a performance obligation:** Revenue is recognized when an entity satisfies a performance obligation, i.e. when the obligation-satisfying transfer is made. The amount of revenue recognized reflects expectations about collectability and (if applicable) an allocation to multiple obligations within the same contract.

   - When revenue is recognized, a contract asset is presented on the balance sheet.
   - Receivable is reported in the seller's balance sheet.
   - If amount is received in advance of transferring good(s) or service(s), a contract liability is reported on seller's balance sheet.

Contract definition under Converged Standard:
According to the standard, a contract is an agreement and commitment, with commercial substance, between the contacting parties. In addition, a contract exists only if collectability is probable.

- Under IFRS, probable means more likely than not;
- Under US GAAP, probable means likely to occur.

Contract Modifications: Unlike previous standards, the converged standard provides guidance for contract modifications.

- A change in a contract is a ***new contract*** if the change would need to involve goods and services that are distinct from the goods and services already transferred.
- A change in a contract is a modification of an existing contract if the change would need to involve goods and services that are not distinct from the goods and services already transferred.

Suppose, a Builder's original cost is $ 1 million plus a bonus of $200,000 if the building is completed within 2 years. Builder Co.'s expected total costs are $700,000. Later, Builder Co. agrees to change the building floor plan and modify the contract.

As a result, the consideration will increase by $150,000, and the allowable time for achieving the bonus is extended by 6 months. Builder expects its costs will increase by $120,000. Builder will account for this change in the contract in the following manner:

Total revenue on the transaction (transaction price) = $1 million original + $150,000 new consideration + $200,000 for the completion bonus = $1.35 million

Builder Co.'s progress toward completion is now = $420,000 costs incurred / total expected costs of $820,000 = 51.2%.

The amount of additional revenue to be recognized = (51.2% × $1.35 million) – revenue already recognized = $91,200 ➔ this would be recognized as a "cumulative catch-up adjustment" on the date of the contract modification.

Under the converged standard, the incremental costs of obtaining a contract and certain costs incurred to fulfill a contract must be capitalized (i.e., reported as an asset on the balance sheet rather than as an expense on the income statement).

Disclosure requirements:

- Companies are required at year end to disclose information about contracts with customers disaggregated into different categories of contracts (e.g. type of product, the geographic region, the type of customer or sales channel, the type of contract pricing terms, the contract duration, or the timing of transfers).
- Companies are also required to disclose balances of any contract-related assets and liabilities and significant changes in those

balances, remaining performance obligations and transaction price allocated to those obligations, and any significant judgments and changes in judgments related to revenue recognition.
- Industries where bundled sales are common (e.g. the telecommunications and software industries) are expected to be significantly affected by the converged standard.

4. EXPENSE RECOGNITION

According to IASB: Expenses are defined as "decrease in economic benefits during the accounting period in the form of outflows or depletions of assets or increase of liabilities that result in decrease in equity (excluding distributions to equity participants)".

4.1 General Principles

Under the accrual method of accounting, expense recognition is based on the matching principle.

Matching principle: According to matching principle expenses incurred to generate revenue are recognized in the same period when the revenue is recognized.

NOTE:
In IFRS, matching principle is known as "matching concept" or "matching of costs with revenues".

Example:
Suppose that the inventory is purchased during the third quarter of one year and sold during the fourth quarter of that year. Then using the matching principle, both the revenue and the expense (i.e. cost of goods sold) will be recognized in the fourth quarter, when the inventory is sold, not in the third quarter when the inventory was purchased.

According to Matching Principle, firm needs to estimate bad debt expense and/or warranty expense in order to recognize the expense in the period of the sale rather than later period.

Types of Expenses:
Period costs: Period costs are expenses that are not directly related to revenue generation and are expensed in the period in which they are incurred e.g. Administration costs. Period costs also include costs that may benefit several accounting periods e.g. depreciation of long-term assets. The allocation of cost over an asset's useful life is called depreciation, depletion, or amortization expense.

Practice: Example 1.
Volume 3, Reading 23.

Alternative Inventory Costing Methods

Specific identification method: The specific identification method is based on the actual physical flow of the goods. It is most frequently used when the company sells a limited variety of high unit-cost items. However, specific identification is often viewed as impractical.

Cost Formulas (IFRS) or Cost Flow Assumptions (U.S. GAAP):

i. **First-in, First-out (FIFO):** In FIFO method, *earliest goods purchased* is the first to be sold and the newest goods purchased (or manufactured) are assumed to remain in inventory. The costs of the most recent goods purchased are recognized as the ending inventory.

Advantage: In FIFO, ending inventory represents the current replacement costs.

ii. **Weighted Average cost:** In the weighted average cost method, it is assumed that the goods available for sale are homogeneous; therefore, allocation of the cost of goods available for sale is based on the weighted average unit cost incurred. The weighted average unit cost is then multiplied by the units sold to determine the cost of goods sold and to the units in hand to determine the ending inventory.

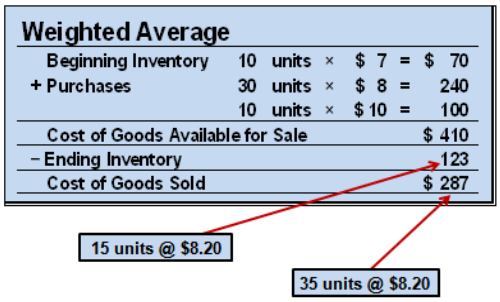
Advantage: It smoothed out price changes.

Weighted Average

Description	# of Units	Cost per Unit	Total Cost
Beginning Inventory	10	7	$ 70
Purchase	30	8	240
Purchase	10	10	100
Cost of Goods Available for Sale	50		$ 410

$$\text{Weighted Average Cost} = \frac{\text{Cost of goods Available for Sale}}{\text{Number of Units Available for Sale}}$$

$$\text{Weighted Average Cost} = \frac{\$410}{50 \text{ units}} = \$8.20 \text{ per unit}$$



iii. Last-in, first-out (LIFO): In the LIFO method, it is assumed that the recent goods purchased are the first to be sold and that the earliest goods purchased remain in ending inventory. This method is permitted under U.S. GAAP only; not under IFRS.

Advantage: It better matches current costs in CGS with revenues.

Example:

Beginning inventory: 200 units @ $10/unit = $2,000

		Scenario 1: Stable Prices		Scenario 2: Rising Prices	
Quarter	Purchases Units	Purchases Unit cost	Purchases Dollars	Purchases Unit cost	Purchases Dollars
1	100	$ 10	$ 1,000	$ 11	$ 1,100
2	150	$ 10	$ 1,500	$ 12	$ 1,800
3	150	$ 10	$ 1,500	$ 13	$ 1,950
4	100	$ 10	$ 1,000	$ 14	$ 1,400
	500		$ 5,000		$ 6,250

Units sold: 100 units per quarter, or in total 400 units

Ending inventory: 300 units

A. FIFO

The 400 units sold (CGS) are assumed to carry the earliest costs incurred and the 300 units left in inventory carry that latest costs.

CoGS			Ending Inventory		
200 @ $ 10 =	$2,000		100 @ $ 14 =	$1,400	
100 @ $ 11 =	$1,100		150 @ $ 13 =	$1,950	
100 @ $ 12 =	$1,200		50 @ $ 12 =	$600	
400	$4,300		300	$3,950	

B. LIFO

The 400 units sold (CGS) are assumed to carry the latest costs incurred and the 300 units left in inventory carry that earliest costs.

CoGS			Ending Inventory		
100 @ $ 14 =	$1,400		200 @ $ 10 =	$2,000	
150 @ $ 13 =	$1,950		100 @ $ 11 =	$1,100	
150 @ $ 12 =	$1,800				
400	$5,150		300	$3,100	

In periods of rising prices

Net Income	Ending Inventory	CGS
• FIFO reports the highest net income.	• FIFO reports the highest ending inventory.	• FIFO reports the lowest CGS.
• LIFO reports the lowest net income; and thus, results in lower income taxes.	• LIFO reports the lowest ending inventory.	• LIFO reports the highest CGS.
• Average cost falls in the middle.	• Average cost falls in the middle.	• Average cost falls in the middle.

In periods of falling prices

Net Income	Ending Inventory	CGS
• FIFO reports the lowest net income	• FIFO reports the lowest ending inventory.	• FIFO reports the highest CGS.
• LIFO reports the highest net income	• LIFO reports the highest ending inventory (assumes no LIFO liquidation)*.	• LIFO reports the lowest CGS (assumes no LIFO liquidation)*.
• Average cost falls in the middle.	• Average cost falls in the middle.	• Average cost falls in the middle.

When prices are constant: All cost flow methods will provide the same results.

***NOTE:**

LIFO Liquidation occurs when the units of goods sold are greater than units of goods purchased in the period; thus, sales are made from the existing, low-priced inventory rather than from recent purchases.

Practice: Example 1 & 2. Volume 3, Reading 23.

4.2 Issues in Expense Recognition

4.2.1) Doubtful Accounts

When goods or services are sold on credit, there is probability that some customers will fail to pay. Under the matching principle, a company is required to record an estimate of revenue that will be uncollectible (i.e. doubtful accounts) at the time revenue is recognized. This estimate can be calculated as follows:

i. As a proportion of the overall amount of sales.
ii. As a proportion of overall amount of receivables.
iii. As a proportion of the amount of receivables overdue by a specific amount of time.

Accounting Treatment: Estimate of uncollectible amounts is reported as an expense on the Income statement rather than as a deduction from revenues.

NOTE:

A Direct Write-off Method is a method in which a company recognizes credit losses on accounts receivables only when a customer default. This method is

NOT consistent with generally acceptable accounting principles.

4.2.2) Warranties

Under matching principle, a company is required to estimate and recognize the amount of future expenses associated with warranties in the period of sale. A company must also update the warranty expense based on the experience over the life of the warranty.

4.2.3) Depreciation and Amortization

Methods of depreciation:

1. **Straight line depreciation method:** In this method, an equal amount of depreciation expense is recognized each year of the asset's useful life.

Straight Line Depreciation expense
$= \left(\frac{Cost - Residual\ value}{\text{Useful life}}\right)$

where,
Residual value or salvage value = Amount of an asset that a company expects to receive upon its sale at the end of the useful life.

- *Annual Depreciation expense is inversely related to useful life of an asset and residual value.*
- Straight-line depreciation is appropriate when an asset's economic value decreases at an approximately constant rate over time.

Example:
Cost = $20,000
Life = 5 years
Residual value = $2,000
Depreciation = (Cost – Residual value) / Life = ($20,000 – $2,000) / 5 = $3,600

2. **Accelerated depreciation method or Diminishing/Declining balance method (DDB):** In this method, a constant rate of depreciation is applied to the declining book value until book value equals residual value. It is considered more appropriate method for matching expenses to revenues. An accelerated depreciation method is appropriate to use when a long-term asset generates proportionally more of its economic benefits in the early years of its life.

DDB uses 200% of the Straight-Line rate as the % rate applied to the declining balance of the asset.

DDB depreciation = (2/useful life)(cost - accumulated depreciation)

Example:
Cost = $20,000,
Life = 5years,
Residual Value = $2,000

Year	Beginning Book Value	Depreciation	Ending Book Value
1	$20,000	$8,000	$12,000
2	12,000	4,800	7,200
3	7,200	2,880	4,320
4	4,320	1,728	2,592
5	2,592	592	2,000
		$18,000	

Final year's depreciation = amount needed to equate book value with salvage value (plugged figure)

= Residual Value

Generally, assets generate more benefits in the early years of their economic life and fewer benefits in the later years. However,

- In early years of an assets life, an accelerated depreciation method results in higher depreciation expense relative to straight line depreciation method. It results in higher expenses and lower net income in the early depreciation years.
- In later years, an accelerated depreciation method results in lower depreciation expense relative to straight line depreciation method. It results in lower expenses and higher net income in later years.

3. **Units of Production method:** In this method, depreciation varies with production or usage.

Intangible assets: Intangible assets refer to assets that lack physical substance e.g. trademarks. Intangible assets with limited useful lives should be amortized. The amortization expense for intangible assets with ***limited lives*** is similar to depreciation i.e. the amortization expense should match the proportion of the assets economic benefits used during the period. Intangible assets with finite/limited useful lives include patent, copyright etc.

NOTE:
Land and intangible assets with indefinite useful lives (e.g. goodwill) are assets, which are neither depreciated nor amortized.

Intangible assets with indefinite useful lives (e.g. goodwill) are tested for impairment at least annually. Asset is impaired when the recoverable or fair value of an intangible asset is materially less than its book value.

Under IFRS: Two alternative models can be used to value property, plant & equipment.

1) ***Cost Model:*** In cost model, asset's depreciable amount (i.e. cost – residual value) is allocated on a systematic basis over the remaining useful life of the asset; and asset is reported at its cost – accumulated depreciation. Note that IFRS does not explicitly prescribe a specific method for depreciation.

2) ***Revaluation Model:*** In revaluation model, asset is reported at its fair value. It is important to note that revaluation model is not allowed under U.S. GAAP.

Differences between IFRS and U.S. GAAP:

i. Under IFRS, unlike U.S. GAAP, each component of an asset must be depreciated separately.
ii. Unlike U.S. GAAP, IFRS requires an annual review of residual value and useful life.

Practice: Example 3 & 4, Volume 3, Reading 23.

4.3 The Implications for Financial Analysis

The firm has a choice to either delay or accelerate the recognition of expenses. An analyst:

- Must evaluate the underlying reasons for a change in an expense estimate of a firm e.g.
  - Determine whether the decrease in bad debt expense is due to improvement in collection experience of the firm or the bad debt expense was decreased to manipulate earnings.
- Should compare expense estimates of a firm to those of other firms within the industry e.g. evaluate whether the firm's warranty expense is lower than the peer firm due to its higher quality goods or it is due to use of aggressive expense recognition.

5. NON-RECURRING ITEMS AND NON-OPERATING ITEMS

Companies should separately report items that are expected to continue in the future from items that are temporary. This helps in assessing companies' future earnings more reasonably .

Following are the items that must be reported separately from the continuing operations.

5.1 Discontinued Operations :

A discontinued operation refers to the operation that company has decided to dispose of or plans to dispose of and thus will not have any involvement in that operation in the future.

Under both IFRS and U.S. GAAP, discontinued operations are reported separately in the income statement. However, to be accounted for as a discontinued operation, the discontinued component must be physically and operationally separable from the rest of the firm.

- The discontinued operations are not expected to generate earnings or cash flow; therefore, analysts must remove these items when formulating expectations about a company.
- These items are reported net of tax.

5.2 Unusual or Infrequent Items:

- Under both IFRS and US GAAP, unusual or infrequent items that are material and/or relevant to the company's financial performance are reported as part of the continuing operations of a company and must be disclosed separately.
- Examples include, restructuring charges, gains/losses on sale of an asset or part of a business etc.
- These items are included in income from continuing operations 'below the line' and are reported before tax.

In formulating expectations about a company, analysts must assess whether these items are expected to re-occur in the future or not.

These items are reported separately Below the Line

Example:

	2001
Net Sales	$3,957
Cost of goods sold	(1.364)
Gross profit	$2,593
SG&A	(1,093)
Special or unusual charges	(251)
Income from continuing operations before tax expense	$1,249
Income tax expense *"Above the line"*	(406)*
Income from continuing operations	$843
**Discontinued operations:	
Income, net of tax *"Below the line"*	203
Gain on disposal, net of tax	98
Income before extraordinary item and change in accounting principle	$1,144
Extraordinary loss, net of tax	----
Cumulative effect of change in accounting principle, net of tax	(118)
Net Income	**$1,026**

* Income from continuing operations is intended to capture the sustainable part of income.

** The items appearing below income from continuing operations, called the non-recurring items (gain/losses), represent the transitory portion of earnings.

5.3 Changes in Accounting Policies

A change in accounting principle refers to a change from one standard e.g. U.S. GAAP or IFRS method to another standard (i.e. a change in inventory costing method from FIFO (IFRS) to LIFO (U.S. GAAP)).

- A change in accounting principle is applied retrospectively i.e. all of the prior-period financial statements currently shown are restated to reflect the change unless it is impractical to do so.
- Retrospective application facilitates analysts to do comparison of the financial statements over time.

Change in Accounting Estimate is applied prospectively i.e. by adjusting only current and future years. Estimates include useful life of a depreciable asset or bad debt expense etc. Companies should disclose significant changes in estimates in the notes.

- Changes in accounting estimates do not change Cash Flows. However, an analyst should evaluate changes in accounting estimates in order to determine the effect of these changes on future operations

Correction for an error for a prior period is applied retrospectively. It refers to change from an incorrect accounting method to the accounting method that is acceptable under accounting standards e.g. U.S. GAAP or IFRS or a correction of an error.

- These changes do not typically affect cash flows. However, analysts should evaluate these changes carefully because these errors may indicate weaknesses of internal controls and accounting systems of a company.

Practice: Example 5, Volume 3, Reading 23.

5.4 Non-Operating Items

- Under IFRS, there is no specific definition of operating activities. Companies have a choice to report operating income or outcomes of operating activities after ensuring that these activities are treated as operating.
- Under U.S. GAAP, operating activities are those which are related to producing and delivering of goods and services whereas transactions related to investing and financing activities are regarded as non-operating.

Example: For a non-financial company, dividends and/or interest received on investments represent non-operating income. Whereas for a financial company (i.e. insurance companies, banks etc.), interests payments received represent operating income.

6. EARNINGS PER SHARE (EPS)

EPS represents shareholder's share of company's earnings.

6.1 Simple Versus Complex Capital Structure

A company's capital has two major components i.e. equity and debt. Under IFRS, EPS is presented for Ordinary shares. Ordinary shares are equity shares that are subordinate to all other types of equity i.e. when a company is liquidated, ordinary shareholders are paid last. Under U.S. GAAP, ordinary shares are known as common stock or common shares.

Simple Capital Structure: A company has a simple capital structure when it does not include financial instruments that are potentially convertible into common shares.

Complex Capital Structure: A company has a complex capital structure when it includes financial instruments that are potentially convertible into common shares i.e. convertible bonds, convertible preferred stock, employee stock options and warrants. Potentially convertible financial instruments have the potential to dilute (decrease) EPS. When a company has complex capital structure, they must compute Diluted EPS.

6.2 Basic EPS

$$\text{Basic EPS} = \frac{Net\ income - Preferred\ dividends}{Weighted\ average\ number\ of\ common\ stock\ outstanding}$$

Shares outstanding are weighted by fraction of year.

Example:

Date	Details	Shares issued (000)
1 January 20×7	Balance at beginning of year	170
31 May 20×7	Issue of new shares for cash	80
31 December 20×7	Balance at year end	250

The weighted average number of shares can be calculated in two ways:

a) (170,000×5/12) + (250,000×7/12) =216,667 shares
b) (170,000×12/12) + (80,000×7/12) =216,667 shares

Example:
On January 1, 2001 ABC Corporation had:

- 160,000 common shares outstanding.
- 10,000 preferred shares, $100 par value, Paying a dividend of 7%
- On September 1, 2001 the company issued 40,000 additional common shares.
- The net income for 2001: $1,257,331
- Preferred dividends = 10,000 x 100 x0.07 = $70,000

Time span	(a) Shares outstanding	(b) Portion of year	Weighted shares (col. a x col. b)
Jan 1 - Aug 31	160,000	2/3	106,667
Sep1 - Dec 31	200,000	1/3	66,667
			173,333

$$\text{Basic EPS} = \frac{\$1{,}257{,}331 - \$70{,}000}{173{,}334 \text{ shares}} = \$6.85 \text{ per share}$$

Practice: Example 6, 7 & 8, Volume 3, Reading 23.

6.3 Diluted EPS

When a company has simple capital structure, Basic EPS = Diluted EPS.

Diluted EPS is always ≤ Basic EPS.
Dilutive Securities: They represent securities e.g. stock options, warrants, convertible debt or convertible preferred stocks that result in reduction in earnings per share when they are exercised or converted into common shares.

Anti-dilutive Securities: They represent securities e.g. stock options, warrants, convertible debt or convertible preferred stocks that result in an increase in earnings per share when they are exercised or converted into common shares.

- ***Under both IFRS and U.S. GAAP***, anti-dilutive securities are not included in the calculation of diluted EPS.

If Converted Method: For convertible bonds and convertible preferred stock If Converted Method is used.

- ***Rule:*** The conversion of the securities into common stock is assumed to occur at the beginning of the year.

6.3.1) Diluted EPS when a Company has Convertible Preferred Stock Outstanding

- **Increase in EPS denominator:** The weighted average number of shares is increased by the additional common shares assumed to be issued.
- **Increase in EPS numerator:** Convertible preferred dividends are added to earnings available to common shareholders.

Diluted EPS = Net income / (Weighted average number of common shares outstanding + New common shares that could have been issued at conversion)

6.3.2) Diluted EPS when a Company has Convertible Debt Outstanding

- **Increase in EPS denominator:** The weighted average number of shares is increased by the additional common shares assumed to be issued.
- **Increase in EPS numerator:** Bonds' after-tax interest expense i.e. interest expense × (1 – tax rate) must be added back to the numerator.

Diluted EPS = *(Net income + After-tax interest on convertible debt – Preferred dividends) / (Weighted average number of common shares outstanding + New common shares that could have been issued at conversion)*

NOTE:
Effects of stock splits and stock dividends:

- **Stock dividend:** In stock dividends, additional shares are distributed to each shareholder in an amount proportional to their current number of shares.
- **Stock split:** In stock split, each old share is divided into a specific number of new shares. However, each shareholder's proportional ownership in the company remain unchanged i.e. the shareholder has more shares but the percentage of the total shares outstanding remains the same.

When number of common stocks increases due to stock dividend or stock splits, EPS calculation reflects the change in number of common shares retroactively to the beginning of the period.

Practice: Example 9 & 10, Volume 3, Reading 23.

6.3.3) Diluted EPS when a Company has Stock Options, Warrants, or Their Equivalents Outstanding

Effect on EPS denominator: The weighted average number of shares is increased by the additional common shares assumed to be issued upon exercise minus the number of shares that would have been purchased with the cash proceeds received.

- When the financial instrument was issued prior to the beginning of the year, the weighted average number of shares outstanding increases by the incremental number of shares.
- When the financial instrument was issued during the year, the incremental shares are weighted by the amount of time the financial instruments were outstanding during the year.

Effect on EPS Numerator: There is no change in the numerator because exercise of these financial instruments does not affect net income.

Diluted EPS =
(Net income - Preferred dividends)/({Weighted average number of common shares outstanding+(New common shares that could have been issued upon exercise - shares that could have been purchased with cash received upon exercise) ×(proportion of year during which the financial instruments were outstanding)})

Note that:

a) Proceeds from conversion are assumed to be used for purchase of treasury stock at ***Average market price*** during the year.
b) Exercise is assumed to occur at the beginning of the year or date of issue, if later.

- Both IFRS and U.S. GAAP use the same method. Under U.S. GAAP, this method is called **Treasury Stock Method (not under IFRS)**.
- Under IFRS, shares repurchased by the company at market prices are known as Inferred shares.

Example:

- Net Income = $8,000
- Common Shares Outstanding (entire year) = 6,000
- Stock Options Outstanding = 2,000
- Exercise Price per Share on Options = $30
- Average Price of Common Shares = $40

1) Options assumed exercised = (2,000 × 30) = $60,000 cash "received" by the company.
2) Shares assumed repurchased with proceeds = ($60,000 / $40) = 1,500
3) Additional shares assumed issued = (2,000 from exercise - 1,500 purchased with proceeds) = 500 net new shares issued.

Practice: Example 11, 12 & 13, Volume 3, Reading 23.

7. ANALYSIS OF THE INCOME STATEMENT

Following are two analytical tools used to analyze the income statement:

1) Common size analysis
2) Income statement ratios

Objective of analysis:

- To assess company's performance over a period of time.
- To compare company's performance with its own past performance or the performance of another company.

7.1 Common size analysis of the Income Statement

In the common size income statement, each income statement item is expressed as a percentage of sales or revenue. It is also known as "vertical common size analysis". Common-size analysis facilitates comparison across time periods (time series analysis) and across companies of different sizes (cross-sectional analysis). It also indicates the differences in companies' strategies i.e. a company with higher gross profit as % of sales may indicate that a company sells technologically superior products with a better brand image and therefore sell the differentiated product at a higher price; and to create brand awareness, company spends on advertising and R&D.

NOTE:

- **Horizontal Common size analysis:** In this analysis, each item of income statement is stated in relation to a selected base year value.
- It is more meaningful to compare amount of taxes with the amount of pre-tax income rather than sales.

See: Exhibit 16, Volume 3, Reading 23.

7.2 Income Statement Ratios

Following are few measures of profitability of a company.

1. **Net profit margin/profit margin/return on sales:** It is used to measure the amount of income that a company was able to generate for each dollar of revenue.

Net profit margin = Net income / Revenue

- Higher the level of net profit margin, higher the profitability.
- Net profit margin can also be found directly from the common-size income statements.

2. **Gross profit margin:** It is used to measure the amount of gross profit that a company was able to generate for each dollar of revenue.

Gross profit margin = Gross profit / Revenue

- Higher the level of gross profit margin, higher the profitability.
- Differences in gross profit margin indicate differences in companies' strategies.

Other ratios include:
Operating profit margin = Operating income / Revenue

Pre-tax margin = Earnings before Taxes / Revenue

8. COMPREHENSIVE INCOME

Income statement does not include all accounting transactions e.g.

- Issuing stock and repurchasing stock are transactions that affect stockholders' equity but do not affect net income.
- When dividends are paid, stockholders' equity reduces, but they do not result in decrease in net income.
- Transactions included in other comprehensive income affect equity but do not affect net income.

Under IFRS: Total comprehensive income is defined as **"**the change in equity during a period resulting from transaction and other events, other than those changes resulting from transactions with owners in their capacity as owners**"**.

- Other comprehensive income includes items of income and expense that are not recognized in profit or loss as required by other IFRS.

Comprehensive income can be reported in two ways:

1) A company can report two statements i.e. a separate income statement and a separate comprehensive statement that includes other comprehensive income.
2) A company can report a single statement of other comprehensive income.

Under U.S. GAAP: "Comprehensive income is defined as "the change in equity (net assets) of a business enterprise during a period from transactions and other events and circumstances from non-owner sources. It includes all changes in equity during a period except those resulting from investments by owners and distributions to owners**"**.

Comprehensive income can be reported in three ways:

1) A company can report comprehensive income at the bottom of income statement.
2) A company can report comprehensive income on a separate statement of comprehensive income.
3) A company can report comprehensive income as a column in the statement of shareholders equity.

Thus, under both IFRS and U.S. GAAP, comprehensive income includes both net income and other comprehensive income i.e. other revenue & expense items that are not included in net income calculation.

Comprehensive Income = NI ± certain revenue and expense items that are excluded from NI, are called OCI (other comprehensive Income).
Other Comprehensive Income (OCI) include:

1) Unrealized gains (losses) on derivative contracts i.e. certain derivative changes that bypass income statement and are recorded in OCI.
2) Unrealized gains (losses) on
   - "available-for-sale" debt securities under US GAAP.
   - Securities (debt or equity) designated as "fair value through OCI" under IFRS.
3) Foreign currency translation gains (losses)
4) Unrealized losses resulting from minimum pension obligations
5) Cash flow hedging derivatives
   - Under IFRS, in addition to the above four items, comprehensive income includes certain changes related to value of long-lived assets using revaluation model rather than cost model.

Note:
Under IFRS companies are not allowed to reclassify certain items of OCI to income statement. Therefore, companies must present separately items of OCI that can and cannot be reclassified subsequently to income statement.

Trading Securities: Securities categorized as trading securities are those that are bought by the company with the intention to actively trade the securities.

- Unrealized gains/losses on trading securities are reported in income statement.

Available-for-sale securities: Available-for-sale securities are investment securities that are not expected to be held to maturity or sold in the near term i.e. are not bought with the intention to actively trade the securities. Available-for-sale securities are reported on the balance sheet at fair value.

- The unrealized gains and losses on available for sale securities are not reported in the income statement; rather, they are reported directly in stockholders' equity as a component of ***other comprehensive income***.

Under, US GAAP,

- unrealized gains and losses are reported in the income statement for:
  - debt securities selected as trading securities
  - equity investments (except ownership positions with substantial influence)

- unrealized gains and losses are reported in the other comprehensive income for:
  - debt securities selected as available for sale

Under, IFRS,

- unrealized gains and losses are reported in the income statement for:
  - equity investments & debt securities (unless both the equity and debt securities make an irrevocable election otherwise). These investments are measured at fair value through profit and loss

- unrealized gains and losses are reported in the other comprehensive income for:
  - debt securities that held within a business model whose objective is attained by collecting cash flows and selling financial assets.
  - equity investments for which the company makes an irrevocable election at initial recognition to represent gains and losses in other comprehensive income.

Practice: Example 14 & 15, Volume 3, Reading 21.

Practice: End of Chapter Practice Problems for Reading 21 + FinQuiz Questions.

2. COMPONENTS AND FORMAT OF THE BALANCE SHEET

The balance sheet (a.k.a. Statement of Financial Position or Statement of Financial Condition) provides information about resources owned (or controlled) by a company (assets) and its sources of capital (equity and liabilities) ***at a specific point in time***. This information can be used to assess a company's ability to meet its short-term obligations, long-term obligations and make distributions to owners.

Basic components of the Balance Sheet include:

1) **Assets**: They represent economic resources of a firm obtained through the firm's past operations or acquisitions and which are expected to generate future economic benefits to the company.

2) **Liabilities**: They represent current or future obligations of the firm arising from past events and which result in expected future outflow of economic benefits from the company.

3) **Owners' Equity**: It represents the amount of assets that would remain once all creditors are paid i.e. owners' residual interest. It is also known as net assets, net worth of the firm, and depending on form of organization, also known as "partners' capital or shareholders' equity".

Owners' Equity = Assets – Liabilities

Accounting equation or balance sheet equation:

Assets = Liabilities + Owners' Equity

Resources controlled by a firm	Sources of capital that finance these resources

Limitations of Balance Sheet in Financial Analysis:

Balance sheet amounts of equity should not be used to represent a measure of market or intrinsic value of a company's equity for following reasons:

i. Differences in measurement bases: In balance sheet, some assets & liabilities are reported at historical cost whereas some are reported at current cost.
ii. Items that are reported at current cost may have different value after the balance sheet is prepared.
iii. Company's ability to generate future cash flows i.e. company's reputation and management skills are not included in its balance sheet.

Format of the Balance Sheet:

There is no standardized format to present balance sheet. However, two commonly used formats include:

1) **Account format:** In an account format, assets are presented on the left hand side of the page and liabilities and equity are presented on the right hand side.

Assets		Liabilities	
Current assets	$XXX	Current liabilities	$XXX
Noncurrent assets	XXX	Noncurrent liabilities	XXX
		Total liabilities	$XXX
Total assets	$XXX		
		Owner's equity	XXX
		Total liabilities and owner's equity	$XXX

2) **Report format:** In a report format, all assets, liabilities, and equity are presented in one column.

Format to present line items of assets and liabilities:

a) **Classified Balance Sheet**: In a classified balance sheet, current and non-current assets and liabilities are reported separately on the balance sheet i.e. current assets are grouped together and current liabilities are grouped together. Similarly, noncurrent assets are grouped together, as are noncurrent liabilities.

- Under both IFRS and U.S. GAAP, companies are required to use **Classified Balance Sheet format**. The separate presentation of current and non-current assets and liabilities facilitates an analyst to assess company's liquidity position.
- Under IFRS, companies are not required to follow any specific order or format to present items on a current/non-current classified balance sheet.

b) **Liquidity-based presentation:** In liquidity-based presentation, all assets and liabilities are presented in decreasing/increasing order of liquidity. This format is generally used by financial companies e.g. banks.

- Under IFRS, *current & non-current classifications are not required when a liquidity-based presentation provides reliable and more relevant information.*

3. CURRENT ASSETS AND CURRENT LIABILITIES

3.1 Current Assets

Assets that are expected to be used or sold up within one year or one operating cycle* of the business, whichever is greater, are referred to as Current assets.

- Current assets provide information regarding company's operating activities and operating capability.

*__Operating cycle__ refers to the average amount of time between acquisition of inventory and the conversion of the inventory back to cash. Note that when a company's operating cycle is not clearly identifiable, it is assumed to be one year.

Among the current assets, items that are required to be reported on the balance sheet include:

- Cash and cash equivalents
- Trade and other receivables
- Inventories
- Financial assets (with short maturities)

Beside these line items, companies may present other line items as needed.

3.1.1) Cash and Cash Equivalents

Cash & cash equivalents are financial assets.

- They include highly liquid, short-term investments with maturity of 3 months or less e.g. demand deposits with banks, U.S. Treasury bills, commercial paper, money market funds etc.
- They involve minor interest rate risk.
- They can be reported either at amortized cost or fair value. For cash & cash equivalents, both methods will provide the same result.
- They do not include amounts that are prohibited to use for at least 12 months.

3.1.2) Marketable Securities

Marketable securities are financial assets. They include investments in publicly traded debt and equity securities e.g. treasury bills, notes, bonds, common stocks, mutual fund shares etc. Their value can be easily determined from price information available in the market.

3.1.3) Trade/Account Receivable

Accounts receivables are type of financial asset that represent amounts owed to a company by its customers as a result of credit sales.

- They are reported at net realizable value (i.e. an estimate of fair value depending on collectability).
- Significantly large increase in accounts receivable relative to sales may indicate that a company is facing problems in collecting cash from its customers.

Allowance for doubtful accounts: It reflects the company's estimate of amounts that will eventually be uncollectible. It is referred to as Contra-asset account.

- Increases in allowance in a particular period are reported as bad debt expense in the income statement and as increase in the balance of allowance for doubtful accounts on the balance sheet.
- Net receivable amount = Gross receivable amount – balance of allowance for doubtful accounts.
- Uncollectible receivables are written off as follows:
  i. Account receivable account is decreased by the amount of uncollectible receivables.
  ii. Allowance for doubtful accounts is reduced by the amount of uncollectible receivables.

Age of accounts receivable: It reflects the length of time the receivable has been outstanding including the number of days past the due date.

Concentration Risk: This risk arises when a company has small and less-diversified customer base i.e. when a single customer accounts for 10% or more of revenue or receivables.

Factors that lead to decrease in Allowance for doubtful accounts as % of accounts receivable:

i. Decrease in the amount of credit sales.
ii. Improvements in the credit quality of the company's existing customers.
iii. Stricter credit policies of the company.
iv. Stricter risk management policies of the company.
v. Bias estimates of management to manipulate reported earnings e.g. in order to inflate reported earnings, management can overestimate collectability and underestimate the bad debt expense for a period.

NOTE:

Liquid Asset: An asset that can be converted into cash easily and in short term period at a price close to its fair market value is called liquid asset.

Practice: Example 1, Volume 3, Reading 22.

3.1.4) Inventories

Inventories refer to physical goods that will eventually be sold to the company's customers. They can be either in the form of finished goods, raw materials, or work-in-progress.

Costs of inventory include:

- All costs of purchase
- Costs of conversion
- Costs incurred in bringing the inventories to their present location and condition.

Costs of inventory exclude:

- Abnormal amounts of wasted materials, labor and overheads.
- Storage costs, unless they are required before further production process.
- Administrative overheads.
- Selling costs.

Techniques for the Measurement of Cost:

a) Standard Cost: It takes into account the normal levels of consumption of materials and supplies, labor, efficiency and capacity utilization. The standard cost is reviewed regularly and, if required, revised according to current conditions.

It should be reviewed on a regular basis to ensure that it approximates actual costs.

b) Retail method: In this method, cost of the inventory is estimated by deducting gross margin from sales. For each homogenous group of items, average gross margin should be used. This method takes into account the impact of marked-down prices.

The retail method is commonly used in the retail trade for measuring inventories of large numbers of rapidly changing items with similar margins and for which it is impracticable to use other costing methods.

Under IFRS:

- Inventories are reported at the lower of cost and the net realizable value (NRV).
  where,
  NRV = estimated selling price – estimated selling costs of completion and costs necessary to make the sale
  NRV is applicable for all inventories under IFRS.
- When NRV< carrying amount, the company must write down the value of the inventory.
- The loss in the value is reported in Income statement.
- If in subsequent years, the written-down inventory rises in value, IFRS allows that amount of original write-down can be reversed.

Under U.S. GAAP:

- When **FIFO** method is used, inventories are measured at the lower of cost and NRV.
- When using LIFO or retail inventory method, inventories are reported at the lower of cost or market value (MV).
  where,
  MV = current replacement cost with upper and lower limits i.e.
  - Market value should not be > NRV. When MV > NRV, use NRV.
  - Market value should not be < (NRV – normal profit margin). When MV < (NRV – normal profit margin), use (NRV – normal profit margin).
- When FIFO method is used, inventories are measured at the lower of cost and NRV.
- When MV < carrying amount, the company must write down the value of the inventory.
- The loss in the value is reported in Income statement.
- Under U.S. GAAP, subsequent reversal of an inventory write-down is not permitted.

Inventory valuation methods (cost formulas under IFRS and cost flow assumptions under U.S. GAAP): Inventory valuation methods refer to valuation methods used to determine cost of inventory i.e. amount reported in cost of goods sold.

- Under IFRS, companies can use FIFO, weighted average cost and specific identification.
- Under U.S. GAAP, companies can use FIFO, weighted average cost, specific identification and LIFO.
- LIFO is not allowed under IFRS.

3.1.5) Other Current Assets

Items that are individually not material enough to be reported as a separate line item on the balance sheet are aggregated into a single account referred to as other current assets. Common items included in other current assets include:

i. **Prepaid expenses** e.g. prepaid rent etc. These items are recorded as asset and are expensed in the future periods as they are used up.
ii. **Deferred tax assets:** Deferred tax assets arises when actual income tax payable based on income for tax purposes in a period is greater than amount of income tax expense based on the reported financial statement income (accounting net income before taxes) due to ***temporary*** timing differences.

- When subsequently the income is recognized on the income statement:
  i. Related tax expense is recognized and
  ii. Deferred tax asset account is reduced by that amount.

- Deferred tax assets may also arise when unused tax losses and credits (due to temporary timing differences) are carried forward.

Important to Note:

Deferred tax assets are recognized only when it is expected that the company will have taxable income in the future which may be used to offset temporary differences or carried forward tax losses or credits to reduce taxes payable.

3.2 Current Liabilities

Liabilities that are expected to be settled within one year or one operating cycle of the business, whichever is greater, are referred to as Current Liabilities.

- Under IFRS, some liabilities e.g. trade payable, accruals for employee and other operating costs are classified as current liabilities even if they will be settled within more than one year after the balance sheet date.
- Examples of current liabilities include: trade payables, financial liabilities, accrued expenses and deferred income.

Following criteria is used to classify the liability as current:

1) Settlement is expected during the normal operating cycle.
2) Settlement is expected within one year.
3) The company does not have any unconditional right to defer settlement for at least one year.

Trade Payables/Accounts payables: They represent the amount that a company owes its suppliers for purchases of goods and services. Significant changes in accounts payable relative to purchases indicate potential changes in the company's credit relationships with its suppliers.

Trade Credit: It refers to credit provided to the company by its suppliers. It represents a source of financing for a company to make purchases.

Notes Payable: They represent financial liabilities that a company is obligated to pay to creditors (banks, trade creditors).

Current portion of long-term debt: Any portions of long-term liabilities that is due within one year.

Income taxes payable: They represent income taxes that have not yet been paid.

Accrued expenses/Accrued liabilities/Other non-financial liabilities: They represent the expenses that have been recognized on the income statement but which have not yet been paid as of the balance sheet date e.g. accrued interest payable, accrued warranty costs, wages payables etc.

Deferred Income/Deferred revenue/Unearned revenue: Deferred revenues arise when a company receives payment in advance of delivery of goods/services e.g. payments received for magazine subscriptions at the beginning of the subscription period.

Practice: Example 2, Volume 3, Reading 22.

4. NON-CURRENT ASSETS

Non-current Assets: Assets that are not expected to be used or sold within one year or one operating cycle of the business, whichever is greater, are referred to as Non-Current assets or Long-lived/Long-term assets.

- Non-current assets provide information regarding infrastructure from which the entity operates.

4.1 Property, Plant and Equipment (PPE)

PPE are tangible assets that are used in company operations and are expected to provide economic benefits over more than one fiscal period e.g. land, buildings, equipment, machinery, natural resources etc.

Under IFRS:

- PPE can be reported either using cost model or revaluation model.
- Companies can choose to report some classes of assets using cost model while other classes of assets using revaluation model.
- However, the company must use the same model for all assets within a specific class of assets.

Under U.S. GAAP:

- PPE can be reported using cost model only.

Cost Model: Under cost method, PPE is reported at amortized cost i.e.

Amortized cost = Historical cost – accumulated depreciation/depletion – impairment losses

where,

a) Historical cost = asset's purchase price + asset's delivery costs + other additional costs incurred to make the asset operable (i.e. installation cost)

b) Depreciation and Depletion: It is the systematic allocation of cost of a long-term asset over its useful life. Cost allocated in each period is referred to as depreciation expense.

c) Impairment losses: Impairment occurs when the asset's recoverable amount is less than its carrying amount.

- When asset is considered impaired, impairment loss is reported in the income statement.
- IFRS allows reversal of impairment losses.
- U.S. GAAP does not permit reversal of impairment losses.

where,

Recoverable amount is higher of asset's fair value minus cost to sell or value in use.

Fair value = It is the amount that is received by selling an asset in an arm's length transaction between knowledgeable willing parties.
Value in use = It is the PV of the future CFs that are expected to be derived from the asset.

NOTE:

- Land is not depreciated.
- The choice of depreciation method and estimates of useful life and salvage value affect both a company's balance sheet and income statement.

Revaluation Model: Under revaluation model, PPE is reported at fair value at the date of revaluation minus any subsequent accumulated depreciation.

- In revaluation model, changes in the value of PPE either directly affect equity or income statement according to the circumstances.

4.2 Investment Property

Investment property refers to the property that is not used in the production of goods/services or for other administrative purposes; rather, it is used to earn rental income or capital gains or both.

- Under IFRS, such property is known as Investment property. Under U.S. GAAP, there is no specific definition for investment property.
- Under IFRS, companies are allowed to use either cost model or fair value model to report investment property. However, a company is required to apply its selected model to all of its investment property.

Cost model: Investment property is reported at cost – accumulated depreciation – accumulated impairment losses.

Fair value model: Investment property is reported at fair value. In this model, any gains/losses resulting from change in fair value of the investment property is recognized in income statement in the period in which it arises.

4.3 Intangible Assets

a) Intangible assets are *identifiable* non-monetary assets that do not have any physical substance e.g. patents, licenses, franchises, copyrights and trademarks.

- These assets may represent internally created assets or acquired by another company.
- In general, (unlike goodwill) acquired intangible assets are reported as separately identifiable intangibles if:
  - Arises from contractual or other legal rights even if those rights are not transferable (e.g. licensing agreement, patents) **or**
  - It is capable of being separated or divided from the acquired entity and sold, transferred, licensed, or exchanged even if there is no intention to do so (e.g. customer lists).
- Under both IFRS and U.S. GAAP, internally created identifiable intangible assets are expensed instead of reporting on the balance sheet.

Under IFRS:

- Identifiable intangible assets are recognized on the balance sheet if "it is probable that future economic benefits will flow to the company and the cost of the asset can be measured reliably".
- For internally created intangible assets, a company must separately identify the research phase (i.e. activities associated with seeking new knowledge/products) and the development phase (i.e. design or testing of prototypes and models).
  - Costs associated with research phase must be expensed on the income statement.
  - Costs incurred in development phase can be capitalized as intangible assets IF certain criteria are satisfied i.e. technological feasibility, ability to use or sell the resulting asset and the ability to complete the project.
- Companies are allowed to report identifiable intangible assets either using cost model or revaluation model.
  - However, revaluation model can only be used when an active market exists for an intangible asset.

Under U.S. GAAP:

- Companies are permitted to use only the cost model to report identifiable intangible assets.
- Companies are not allowed to capitalize costs associated with internally created intangible assets. All such costs must be expensed on the income statement.

Under both IFRS and U.S. GAAP, following costs are typically expensed:

- Internally generated brands, customer lists etc.
- Start-up costs
- Training costs
- Administrative and other general overhead costs
- Advertising and promotion
- Relocation and reorganization expenses
- Redundancy and other termination costs.

b) Intangible assets that are *not identifiable* include:

- Accounting goodwill, which arises in business combinations.
- Management skill, good reputation etc. These assets are usually reflected in the equity price of the company. These assets can be recognized as goodwill but only when acquisition occurs.

Amortization and Impairment Principles:

- An intangible asset with a ***finite*** useful life is ***amortized*** systematically over its useful life.
  - Amortization method and estimated useful life must be reviewed at least on annual basis.
- For intangible asset with a ***finite*** useful life, impairment principles are the same as for PPE.
- An intangible asset with an **indefinite** useful life is not amortized; rather, it is ***tested for impairment*** at least annually.

Generally, analysts exclude intangibles in assessing financial statements i.e.

- Book value assigned to intangibles is removed from net equity and
- Pre-tax income is increased by amortization expense or impairment associated with intangibles.

Practice: Example 3, Volume 3, Reading 22.

4.4 Goodwill

Goodwill is the excess amount paid for a company in a business combination over the fair market value of the company's identifiable assets & liabilities. It is recognized as an asset.

An analyst should differentiate between accounting goodwill and economic goodwill.

a) *Accounting Goodwill:* It is based on accounting standards and is recognized only when acquisitions take place.

b) *Economic Goodwill:* It is based on economic performance of the company. However, it is not reflected on the balance sheet; rather, it is reflected in the stock price of a company (theoretically).

- Under both IFRS and U.S. GAAP, accounting goodwill that results due to acquisitions is ***capitalized***.
- Goodwill is tested for impairment at least annually (not amortized).
  - If goodwill is impaired, impairment loss is reported in the income statement in the current period.
  - Impairment loss leads to decrease in current earnings, total assets; whereas, return on assets (net income / average total assets) may increase in future periods.
  - Impairment loss is a ***non-cash*** item.

Accounting Standards' Requirements for recognizing Goodwill:

A. First of all, total cost to purchase the target company (i.e. acquiree) is determined.

B. The acquiree's identifiable assets, liabilities and contingent liabilities are measured at fair value i.e.

Net identifiable assets acquired by a company =
Fair value of Identifiable assets - Fair value of liabilities and contingent liabilities

C. Goodwill is the excess amount over the fair market value of the company's net identifiable assets acquired.

- When the value of net identifiable assets acquired is greater than purchase price of net identifiable assets acquired, such a transaction is referred to as ***Bargain purchase***.
- Any gain/loss arising from bargain purchase transactions is reported in the income statement in the current period.

Estimation issues:

- Estimation of fair value involves significant management judgment. This judgment associated with recognition and impairment of goodwill can affect comparability of financial statements across companies.
- Therefore, for comparison purposes, analysts make adjustments to company's financial

statements by removing the impact of goodwill as follows:
  - Goodwill is removed from balance sheet data used to compute financial ratios.
  - Goodwill impairment loss is removed from income statement in order to analyze the operating trends of a company.
- By analyzing the purchase price paid relative to the net assets and earnings prospects of the acquired company, analyst can anticipate company's future performance after acquisition.

Practice: Example 4, Volume 3, Reading 22.

4.5 Financial Assets

Financial assets include company's investments in stocks issued by another company or its investments in notes, bonds or other fixed-income instruments issued by another company or government entity.

Financial liabilities include notes payable and bonds payable issued by the company itself.

Derivative is a type of financial instrument that can be classified as either an asset or a liability depending on the contractual terms and current market conditions. Derivative instrument involves little or no initial investment and its value is derived based on some underlying factors e.g. interest rate, security price etc.

- Derivatives (both stand-alone and embedded in non-derivative instruments) are measured at fair value.
- Non-derivative instruments whose fair value exposures are hedged by using derivative instruments are measured at fair value.

Measurement Bases of Financial Instruments:

After initial acquisition, subsequently, Financial instruments can be measured in two ways:

1) **Fair value:** It is the transaction price at which an asset is sold or a liability is settled in an orderly market transaction.

2) **Amortized cost:** It refers to

Amortized cost = Amount at which the financial instrument was initially reported – principal repayments +/- amortization of discount or premium – impairment

Changes in Financial assets can be measured as either at:

i) amortized cost or
ii) fair value through other comprehensive income (FVOCI) or
iii) fair value through profit or loss (FVPL).

Assets measured at 'amortized cost':

No unrealized gain/loss is reflected on either balance sheet or income statement.

Under IFRS financial assets can be measured at amortized cost only if they meet the following two criteria:

1) The business model is to hold the financial assets till maturity.
2) The contractual cash flows occur on pre-specific dates and are solely payments of principal and interest on principal.

Under US GAAP similar concept as mentioned above is referred to as held-to-maturity

Example:
Long-term bond issued by another company or ***long-term loans*** made to other companies.

Assets measured at 'fair value through other comprehensive income (FVOCI)'

Any unrealized holding gain/loss is recognized in other comprehensive income

Under IFRS financial assets can be measured at FVOCI if Business model objective is to sell the financial instrument as well as to collect contractual cash flows.

Assets measured at FVOCI, any unrealized gain or losses are recognized in other comprehensive income.

Examples:
- Debt investments consist solely of principal and interest and whose cash flows occur on prespecified date.
- Equity investments (if at the time of purchase company makes an irrevocable decision to measure any unrealized gains/losses of these investments as FVOIC).

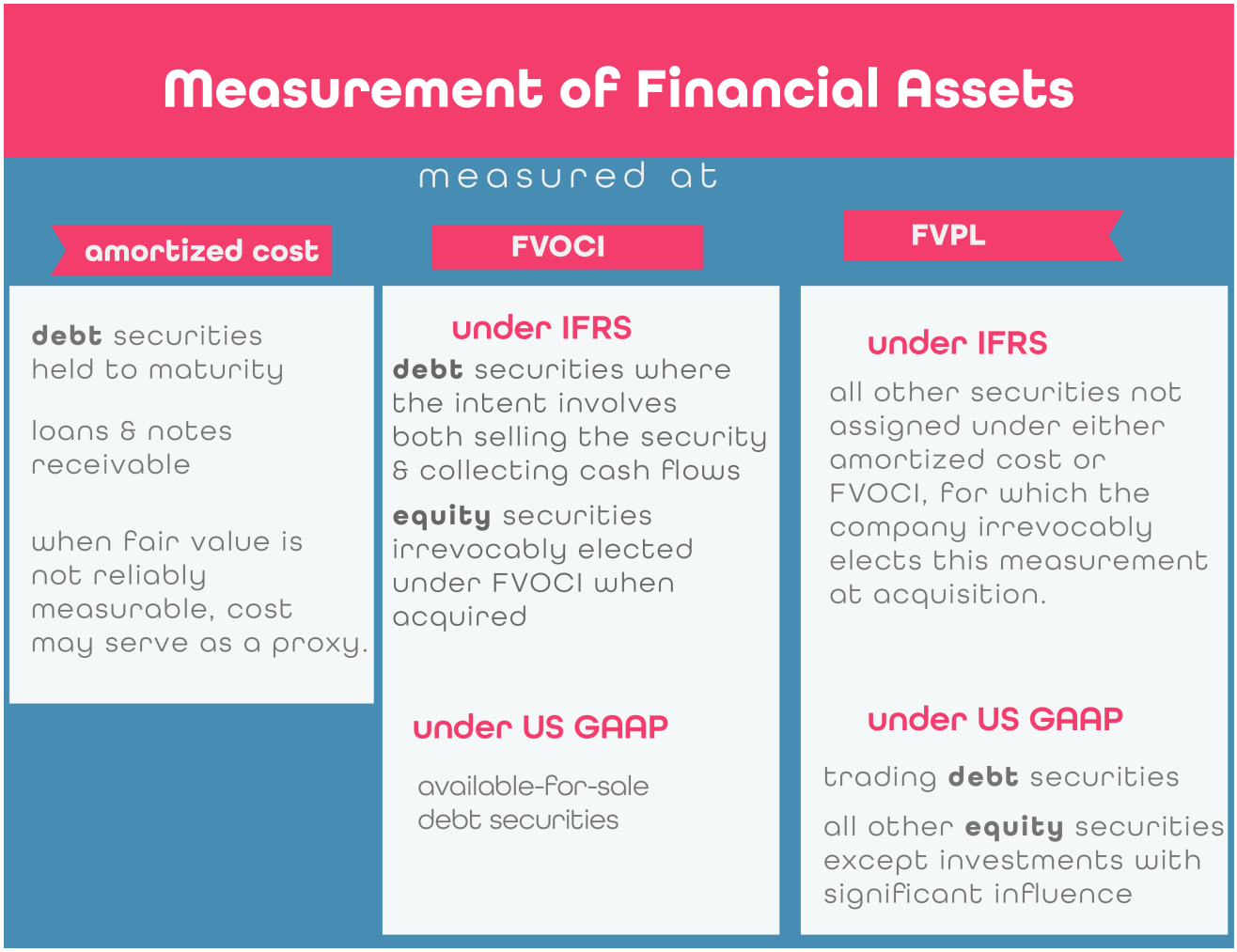
Under US GAAP, similar concept as mentioned above is referred to as available-for-sale securities. However, unlike IFRS, under US GAAP this concept is **only** applicable to **debt** securities.

Assets measured at 'fair value through profit or loss (FVPL)'

Any unrealized holding gains/losses are recognized as profit/loss on the income statement

Under IFRS, assets (debt or equity) not measured under the amortized cost or FVOCI, are measured at FVPL if at the time of purchase company makes an irrevocable decision to measure any unrealized gains/losses of these investments as FVOIC.

Under US GAAP, all equity investments (*except ownership position with significant influence)*, are measured at FVPL. In addition, debt securities acquired with the intent to selling it i.e. designated as trading securities are also measured at FVPL.



Reference: CFA Institute's Curriculum Reading 22, Exhibit 10.

4.6 Deferred tax Assets

Deferred taxes – income taxes incurred prior to time in a way that the income tax expenses will be recognized in the income statement.

Deferred tax asset arises when income tax payable in a period is > amount of income tax expense due to temporary differences.

When subsequently the income is recognized the income statement:

a. Related tax expense is recognized and
b. Deferred tax asset account is reduced by that amount.

In some cases (e.g. allowance for bad debts) there is timing difference between financial reporting income and tax reporting income (as tax authorities do not recognize allowance for bad debt but do recognize actual bad debts) which results in tax payable being higher than tax expense in current year (in financial statements). Firms can report a deferred tax asset in such cases. This represents expected reduction in future tax payments (e.g. when actual bad debts happen) – known as reversal of timing differences.

Deferred tax assets may also arise when unused tax losses and credits (due to temporary timing differences) are carried forwards.

5. NON-CURRENT LIABILITIES

Non-Current Liabilities: Liabilities that are not expected to be settled within one year or one operating cycle of the business, whichever is greater, after the reporting period are referred to as Non-Current Liabilities.

5.1 Long-Term Financial Liabilities

Long-term financial liabilities include:

- Loans e.g. borrowing from banks
- Notes or Bonds payable

Measurement Base:

- Liabilities i.e. loans payable and bonds payable are reported at ***amortized cost*** on the balance sheet.
  - At maturity, the amortized cost of the bond equals face value of the bond.
- Financial liabilities which are reported at ***fair value*** rather than at cost include:
  - Liabilities classified as "held-for-trading".
  - Derivatives that represent company's liability.
  - Non-derivative instruments i.e. those which are hedged using derivative instruments.

5.2 Deferred Tax Liabilities

Deferred tax liabilities represent liabilities that arise when actual tax payable in a period is less than reported tax expense based on accounting income due to ***temporary*** timing differences.

- Deferred tax liabilities may arise when company include expenses in ***taxable income*** in earlier periods than for financial statement net income. Consequently, taxable income and taxes payable in earlier periods will be less than financial statement net income & income tax expense. ***For example***, use of accelerated depreciation methods for tax purposes and straight-line depreciation methods for financial statement purposes.
- Deferred tax liabilities may also arise when company include items of income in ***taxable income*** in later periods than for financial statement net income.

6. EQUITY

Equity refers to residual claim of the owner on company's net assets (assets minus liabilities). Equity includes:

- Funds that are directly invested in the company by the owners.
- Company's retained earnings i.e. earnings that have been reinvested over time instead of distributed as dividends.
- Gains/losses that are not yet recognized on the company's income statement.

6.1 Six Components of Equity

1) **Capital Contributed by Owners (or common stock or issued capital):** It refers to the amount that is contributed to the company by its owners. Common

shares may be issued at par value (stated value) or may be issued without any par value.

- When common shares are issued at par value, it must be disclosed in the equity section of the balance sheet.
- The company must also disclose the following for each class of share issued:
  i. Number of ***authorized shares***→ number of shares that a company can sell under its articles of incorporation.
  ii. Number of ***shares issued*** → number of shares that have been sold to investors.
  iii. Number of ***shares outstanding*** → (number of shares issued – treasury shares)

2) Preferred Shares: Preferred shares are shares with rights that are given priority over the rights of common shareholders e.g. rights to receive dividends prior to common shareholders and rights to receive assets in case of company liquidation.

Preferred shares are classified as equity or financial liabilities depending upon their characteristics, not legal form e.g.

- Perpetual, non-redeemable preferred shares are classified as equity.
- Preferred shares with mandatory redemption at a fixed amount at a future date are classified as financial liabilities.

3) Treasury Shares/ Treasury Stock or Own Shares Repurchased: Treasury shares represent shares that are repurchased by the company (but not retired/cancelled).

- Treasury shares do not have voting rights and do not receive any dividends declared by the company.
- Treasury shares represent a ***contra equity account*** i.e. when shares are repurchased,
  i. Shareholder's equity is reduced by the amount of the acquisition cost and
  ii. Number of total shares outstanding is reduced.
- However, no gain or loss can be recognized when treasury shares are re-issued.

The reasons to buy back own outstanding shares may include:

a) To create or improve the market for the stock when shares are considered undervalued by management.
b) To provide shares for employee stock compensation contracts.
c) To offset the effects of dilution of EPS from various employee stock compensation plans.

4) Retained Earnings (R/E): Retained earnings represent accumulated earnings that have not been distributed to owners as dividends.

5) Accumulated Other Comprehensive Income (or other reserves): It represents the accumulated amount of other comprehensive income or loss. It includes all changes in stockholders' equity excluding transactions that are recognized in the income statement (net income) and transactions with shareholders (owners) i.e. issuing stock, reacquiring stock, and paying dividends. For example, unrealized gains/losses on investments in securities, translation adjustment, unrealized losses from pension plans.

6) Non-controlling Interest (or Minority Interest): It represents the minority shareholders' pro-rata share of the equity of a subsidiary that is not wholly owned by the parent.

6.2 Statement of Changes in Equity

The statement of changes in equity (statement of shareholders' equity) presents all information regarding changes in company's equity over reporting period.

Under IFRS, following information must be provided in the Statement of Changes in Equity:

- Total comprehensive income for the period.
- The effects of retrospective application and retrospective restatement.
- Capital transactions with owners and distributions to owners.
- Reconciliation between the carrying amount at the beginning & end of the period showing profit or loss.

Under U.S. GAAP, companies are required to provide an analysis of changes in each component of stockholders' equity that is presented in balance sheet.

7. ANALYSIS OF THE BALANCE SHEET

Balance sheet can be analyzed using following two tools:

1. **Common-size Analysis (or vertical common-size analysis):** A common-size balance sheet restates all assets and liabilities as a percentage of total assets.

- This analysis allows the analyst to quickly and easily analyze which accounts have increased or decreased relative to total assets and to compare company's balance sheet composition over time and across companies in the same industry e.g. Company with cash & short-term marketable securities as a greater proportion of total assets

compared to other company may indicate that it is more liquid.
- It also indicates the differences in companies' strategies e.g.
  - Company with a greater proportional investment in PPE may indicate that it is a manufacturing company.
  - Company with greater proportion of goodwill may indicate that it pursues growth by acquisition instead of internal growth strategy.

Practice: Example 5 & 6, Volume 3, Reading 22.

2. Balance Sheet Ratios: Ratios can be used to

i. Assess company's performance over a period of time.
ii. Compare company's performance with its own past performance or the performance of another company.

Balance Sheet Ratio analysis allows the analyst to quickly and easily analyze company's liquidity and solvency positions.

Balance sheet Ratios:

a) Liquidity ratios: Liquidity ratios indicate company's ability to meet current liabilities. They include:

i. Current ratio: Current assets/Current liabilities
- Higher the ratio, greater the company's liquidity.

ii. Quick (acid-test) ratio: (Cash + Marketable securities + Receivables)/Current Liabilities
- Higher the ratio, greater the company's liquidity.

iii. Cash ratio: (Cash + Marketable securities)/Current Liabilities
- Higher the ratio, greater the company's liquidity.

Working Capital: It refers to excess of current assets over current liabilities i.e.

Working capital = *current assets – current liabilities*

- Working capital indicates a firm's ability to meet its liabilities as they come due.
- Inadequate amount of working capital indicates liquidity problems.
- Too much working capital may indicate an inefficient use of assets.

b) Solvency ratios: Solvency ratios indicate ability of the company to meet its long-term and other obligations. Solvency ratios* include:

i. Long-term debt-to-equity ratio = Total Long-term Debt / Total Equity
ii. Debt-to-Equity ratio = Total Debt / Total Equity
iii. Total Debt ratio = Total Debt / Total Assets
iv. Financial Leverage ratio = Total Assets / Total Equity

***** Higher ratios indicate higher risk.

Limitation of ratio analysis:

- Ratio analysis involves significant amount of judgment.
- Liquidity ratio e.g. current ratio only incorporates the amount of current assets but the components of current assets are ignored. Thus, it is only a rough measure of liquidity.
- Current ratio is highly sensitive to end-of-period operating & financing decisions of a company.

NOTE:

- Ratio analysis should be based on entire company's operations, its competitors, external economic and industry environment in which the company operates.
- For diversified companies, it is more appropriate to use industry-specific ratios for different lines of business.

Practice: Example 7, Volume 3, Reading 22.

Practice: CFA Institute's end of Chapter Practice Problems and FinQuiz Questions.

1. INTRODUCTION

The statement of cash flows reports the company's cash movements (inflow & outflows) during the period associated with ***operating***, ***investing*** and ***financing*** activities.

The primary purpose of cash flow statement is to provide information about a company's cash receipts and cash payments. The statement of cash flow complements the income statement and balance sheet.

Statement of Cash Flows Format

Cash Flows from Operating Activities		
Net income		$XXX
Add: Depreciation, amortization	$XXX	
Increases in current liabilities	XXX	
Decreases in current assets	XXX	
Less: Increases in current assets	(XXX)	
Decreases in current liabilities	(XXX)	
Add: Losses from investing/financing activities	XXX	
Less: Gains from investing/financing activities	(XXX)	XXX
Net cash provided by (used by) operating activities		XXX
Cash Flows from Investing Activities		
Sale of property/investments	XXX	
Purchase of property/investments	(XXX)	
Net cash provided by (used by) investing activities		XXX
Cash Flows from Financing Activities		
Sale of debt or equity securities	XXX	
Repurchase/Payment of debt or equity securities	(XXX)	
Payment of dividends	(XXX)	
Net cash provided by (used by) financing activities		XXX
Net increase in cash		XXX
Beginning cash		XXX
Ending cash		$XXX

Uses of Cash Flow Statement:

- Cash flow statement provides a reconciliation of the beginning and ending cash balance on the balance sheet.
- It facilitates creditors, investors and analysts to evaluate the company's liquidity, solvency and financial flexibility.

It is important to *note that*:

- Cash flow is not the same as net income. A company can operate at a profit and continually be short of cash. It can also generate huge inflows of cash from operations and still report a loss.
- Cash flow statement shows the movement of cash into and out of the company; and it can be affected by several noncash transactions.

Difference between Cash Flow Statement and Income Statement:

- Income statement reflects revenue when it is earned rather than when cash is collected by the company.
- Cash flow statement reflects cash receipts when collected rather than when revenue was earned.

2. COMPONENTS AND FORMAT OF THE CASH FLOW STATEMENT

2.1 Classification of Cash Flows and Non-cash Activities

Under both IFRS and U.S. GAAP, following classifications are used in the cash flow statement.

A. Operating Activities

Operating activities include company's day-to-day activities associated with either generating revenue or the direct cost of producing a product or service. Operating activities section of the cash flow statement provides information about the cash generated from a company's daily operating activities.

- **Operating activities that generate cash *inflows*** include collections from sales of their primary products or services, collection of accounts receivable, receipts of interest and dividends, and other operating cash receipts.
- **Operating activities that create cash *outflows*** include payments to suppliers for inventories, cash payment associated with accounts payable, payments to employees, interest payments, payment of income taxes and other operating cash payments (e.g. payments related to dealing or trading securities, not *buying or selling securities*).

B. Investing Activities

Investing activities include buying and selling of noncurrent assets (e.g. PPE, intangible assets, long-term & short-term investments in equity & debt issued by other companies* etc.), which will be used to generate revenues over a long period of time. Lending money and receiving loan payments would also be considered investing activities.

- **Investing activities that create cash *inflows*** include sales of noncurrent assets e.g. property, plant, and equipment.
- **Investing activities that create cash *outflows*** include the purchase of noncurrent assets e.g. property, plant, and equipment.

it does not include securities that are classified as cash equivalents and/or securities held for dealing or trading purposes.

C. Financing Activities

Financing activities include borrowing and repaying money, issuing stock (equity) and paying dividends.

- **Financing activities that create cash *inflows*** include cash received by issuing stock (common or preferred), or bonds or cash received from borrowing/debt issuance.
- **Financing activities that create cash *outflows*** include cash paid to repurchase stock and to repay debt/borrowings.

Non-Cash Transaction:

A non-cash transaction is a transaction that does not involve any cash inflow or outflow and thus they are not reported in the cash flow statement e.g. issuing stock in case of conversion of a convertible bond, exchanging one non-monetary asset for another non-monetary asset.

However, *a company is required to disclose any significant non-cash transaction* in a separate note or in a supplementary schedule to the cash flow statement.

Cash Flows from Operating Activities
+/- Cash Flows from Investing Activities
+/- Cash Flows from Financing Activities
= Net Change in Cash during period
+ Beginning Cash balance
=Ending Cash balance

2.2 A Summary of Differences Between IFRS and U.S. GAAP

	IFRS*	U.S. GAAP
Interest paid	Operating or Financing	Operating
Interest received	Operating or Investing	Operating
Dividends paid	Operating or Financing	Financing
Dividends received	Operating or Investing	Operating
Income tax	• Income tax associated with Operating activities →Operating • Income tax associated with Investing activities → Investing • Income tax associated with Financing activities →Financing (if it can be specifically Identified)	
Bank overdrafts	Viewed as part of Cash Equivalents	Classified as financing; not as part of cash and cash equivalents
Format of Cash flow statement**	Direct or indirect; preferred method is direct method.	Direct or indirect; preferred method is direct method. • In addition, a company is required to provide a reconciliation of net income to cash flow from operating activities (equivalent to indirect method) irrespective of method used. • When indirect method is used, no direct-format disclosures are required.

* A company must use a consistent classification from one period to another and must disclose separately the amounts of interest & dividends received or paid and where these amounts are reported.
** Most of the companies use indirect method.

NOTE:

CFA institute prefers Direct method.

Practice: Example 1 & 2, Volume 3, Reading 23.

3. THE CASH FLOW STATEMENT: LINKAGES AND PREPARATION

The beginning and ending balance sheet values of cash and cash equivalents are linked through the cash flow statement i.e.

Beginning cash + Cash receipts (operating, investing and financing activities) – Cash payments (operating, investing and financing activities) **= Ending cash**

Due to the differences between timing of accrual basis and cash basis accounting, any operating transaction leads to increase or decrease of short-term liability or asset on the balance sheet e.g.

- When revenue reported (based on accrual accounting) is greater than cash actually collected, → A/R ↑. However, it may also be possible that accrual based revenue will be higher due to decrease in an unearned revenue (liability account).
- When expenses reported (based on accrual accounting) is less than cash actually paid, → A/P ↓ or there is a decrease in some other accrued liability account. However, it may also be possible that accrual based expenses will be lower due to increase in prepaid expenses, or another asset account.

2.3 Direct and Indirect Methods for Reporting Cash Flow from Operating Activities

There are two methods of calculating and reporting the net cash flow from operating activities. Both methods result in identical figures for net cash flow from operating activities i.e. the ***amount*** of operating cash flow is same, only ***presentation format*** differs.

NOTE:

Indirect and Direct methods must be equal to each other.

These methods are as follows.

1. **Direct Method:** The direct method reports gross cash inflows and gross outflows from operating activities.

3.2.1) Operating Activities: Direct Method*

Cash Received from Customers
– Cash paid for inventory
– Cash paid for operating expenses
– Cash paid for income taxes
– Cash paid for interest
+Cash received from dividends and interest
= **Net cash from operating activities**

**Calculations are shown below in Section 3.2.1.1 to 3.2.1.6*

3.2.1.1 Cash Received from Customers/Cash Collections/Cash Collections from Customers

Sales or Revenue
– Increase in A/R **(or)**+ Decreases in A/R
+ Increase in unearned revenue **(or)** – Decrease in unearned revenue
= Cash Received from Customers

Or

Cash Received from Customers/Cash Collections/Cash Collections from Customers

Beginning A/R
+Revenue or sales
– Ending A/R*
= Cash Received from Customers

*****Ending A/R =*** *Beg A/R + Revenue – Cash Collected from Customers*

NOTE:

An increase in revenue coupled with a decrease in cash received from customers indicates collection problems.

Practice: Example 3 & 4, Volume 3, Reading 23.

3.2.1.2Cash Paid For Inventory (Cash paid to Suppliers)

Cost of Goods Sold
+ Ending Inventory*
– Beginning Inventory
= Purchases
+ Beginning A/P
– Ending A/P
= Cash Paid for inventory

*****Ending inventory =*** *Beginning inventory + Purchases – Cost of Goods Sold*

NOTE:

- When all purchases are made with cash, A/P will not change and cash outflows = purchases.
- When A/P increase (decrease) during the period, purchases on accrual basis > (<) purchases on cash basis.

3.2.1.3Cash paid to Employees:

Salary and wage expense
– Increase (+ decrease) in salary & wage payable
= **Cash paid to Employees**

where,

Beginning salary & wages payable

+ Salary and wage expense
– Cash paid to employees
= **Ending salary and wages payable**

3.2.1.4 Cash Paid for Other Operating Expenses

Other Operating Expenses (do not include interest expense, depreciation expense, gains & losses from sale of investments).

Other Operating Expenses

– Decrease in Prepaid expenses
– Increase in other Accrued liabilities
= Cash paid for Operating expenses

NOTE:

- When prepaid expenses increase during the period, other operating expenses on cash basis is greater than other operating expenses on accrual basis.
- When accrued expense liabilities increase during the period, other operating expenses on cash basis is less than other operating expenses on accrual basis.

Practice: Example 5, Volume 3, Reading 23.

3.2.1.5 Cash Paid for Interest

Interest Expense
+ Decrease (increase) in interest payable
= Cash paid for Interest

where,

Beginning interest payable
+ Interest expense
– Cash paid for interest
= Ending Interest payable

NOTE:

- When interest payable increase (decrease) during the period, interest expenses on accrual basis > (<) interest expense on cash basis.

Total dividends paid = Dividends paid ± decreased(increase) in Dividends payable

3.2.1.6 Cash Paid for Income Taxes

Income Tax Expense
– Increase (+ decrease) in accrued tax payable
– Decrease (+ increase) in prepaid tax
= Cash paid for Income Taxes

Cash Received from Dividends and Interest

Dividend and Interest Income
+ Beginning interest receivable
– Ending interest receivable
= Cash Received from Dividends and Interest

Uses of Direct Method:

- Direct method separately shows each cash inflow and outflow associated with operating activities of a company.
- Direct method provides information about specific ***sources*** of operating cash inflows and outflows; whereas indirect method only provides the net result of these cash inflows and outflows.

NOTE:

Analysts prefer direct-format information.

2. **Indirect Method:** The indirect method reconciles net income with net cash flow from operating activities by adjusting net income for deferrals, accruals, items that effect investing and financing cash flows and changes in operating working capital items.

Net income

Plus:

- Non cash charges (i.e. depreciation, amortization, depletion expense)
- Increases in current operating liabilities
- Decreases in current operating assets
- Increase in deferred income tax liability

Less:

- Increases in current operating assets
- Decreases in current operating liabilities
- Decrease in deferred income tax liability

Plus: Losses from investing or financing activities (i.e. loss on sale or write-down of assets, loss on retirement of debt, loss on investments accounted under Equity method)

Less: Gains from investing or financing activities (e.g. gain on sale of equipment; gain on retirement of debt, income on investments accounted under Equity method)
= Net cash provided by (used by) Operating activities

Adjustments to reconcile net income with net cash provided by operating activities:

Net Income

+ Depreciation
– Amortization of Bond Premium
+ Amortization of Bond Discount
– Gain on sale of Equipment
+ Loss on sale of Equipment

+ Decrease in A/R
– Increase in A/R
+ Decrease in Inventory
– Increase in Inventory
+ Increase in A/P
– Decrease in A/P
+ Increase in Accrued liabilities
– Decrease in Accrued liabilities
– Increase in Prepaid expenses
+ Decrease in Prepaid expenses
+ Increase in Taxes payable
– Decrease in Taxes payable
= Net cash provided by (used by) operating activities

Uses of Indirect Method:

- Indirect method provides information regarding the reasons for differences between net income and operating cash flows.
- It reflects a forecasting approach i.e. future income is forecasted and then cash flows are derived by making adjustments for changes arising due to timing differences between accrual and cash accounting.

NOTE:

The presentation format of cash flows from investing and financing activities is the same irrespective of method used to present operating cash flows.

3.2.2) Cash Flows from Investing Activities: Direct Method

Proceeds (cash received) from sale of Assets
– Purchases of Property and Equipment
= Total Net Cash provided (used) by Investing activities

where,

Calculation for Cash received from sale of Assets:

Historical cost of equipment sold (computed below)
– Accumulated depreciation of equipment sold (computed below)
= Book value of equipment sold
+ Gain on sale of equipment (from I/S) (or) – Loss on sale of equipment
= **Cash received from sale of equipment (assets)**

Calculations for Historical cost:

Beg balance equipment (from B/S)
+ Equipment purchased (from notes)
– Ending balance equipment (from B/S)
= **Historical Cost of Equipment Sold**

Calculations for Accumulated Depreciation:

Beg balance accumulated depreciation (from B/S)
+ Depreciation expense (from I/S)
– Ending balance accumulated depreciation (from B/S)
= **Accumulated depreciation on equipment sold**

Practice: Example 6 & 7, Volume 3, Reading 23.

3.2.3) Financing Activities: Direct Method

Cash Flows from Financing Activities:

Proceeds from new Borrowings
– Repayment of loans
– Principal payments (e.g. under capital lease obligations)
– Dividends paid
+ Proceeds from issuance of common stock
–Cash paid to repurchase common stock
+ Capital contributions by partner/owner
= **Total Net Cash provided (used) by Financing activities**

where,

Dividends paid = Beg balance of Retained earning (from B/S) + Net income (from I/S) – Ending balance of Retained earnings (from B/S)

Cash Flow Statement: Direct Method

Cash Received from Customers
– Cash paid for inventory
– Cash paid for operating expenses
– Cash paid for income taxes
– Cash paid for interest
+ Cash received from dividends and interest
= Net cash from operating activities
Cash received from sale of equipment
Cash paid for purchase of equipment
= Net cash used for investing activities

Cash paid to retire long-term debt
Cash paid to retire common stock
Cash paid for dividends
= Net cash used for financing activities
Net increase (decrease) in cash
+ Beginning cash balance
= Ending cash balance

NOTE:

Net cash flow added to beginning cash balance ***must result in*** ending cash balance.

3.3 Conversion of Cash Flows from the Indirect to the Direct Method

Step 1: Calculate Net income as follows:

Net income = Total revenues – Total expenses

Step 2:

a) Remove all non-cash revenue items from Total revenue
b) Remove all non-cash expense items from total expenses

c) Expenses excluding non-cash items i.e. (CGS) + salary & wage expenses + other operating expenses + interest expense + income tax expense = Total expenses

Step 3: Convert accrual amounts to cash flow amounts by making adjustments for working capital changes as follows:

Cash received from customers – Cash paid to suppliers – Cash paid to employees – Cash paid for other operating expenses – Cash paid for interest – Cash paid for income tax = Net cash provided (used) operating activities

4. CASH FLOW STATEMENT ANALYSIS

Cash flow statement analysis facilitates in understanding the business of a company and forecasting company's future cash flows. Cash flow statement analysis facilitates creditors, investors, analysts and other users of financial statement data to evaluate:

- Firm's ability to generate cash flows in the future
- Firm's capacity to meet cash obligations
- Firm's future external financing needs
- Firm's effectiveness in implementing financing and investing strategies

4.1 Evaluation of the Sources and Uses of Cash

Major sources of cash vary with the stage of growth of a company e.g.

Mature company:

- For a mature company, operating activities should be the primary source of cash flows. When a company has no profitable investment opportunities, operating cash flow should be returned to capital providers (financing activities).

Growth stage company: For a new or growth stage company, initially, operating cash flow may be negative as it invests to grow the business; however, eventually, operating cash flows must be positive because generating negative operating cash flows over long-term is not sustainable for the company.

Importance of positive and sustainable cash flows from operating activities:

- The company should generate sufficient operating cash flows to meet capital expenditures. When a company consistently has negative operating cash flow, it will need to borrow money or issue stock to meet this shortfall.
- Positive trends in operating activities cash flow may encourage owners & other capital providers to consider long-term financing as an aid to growth of a company.
- Positive trends in operating activities cash flow indicate company's ability to generate cash for debt repayment.
- Strong cash flow from operating activities will also make it easier for the company to acquire financing and will help in negotiating with lenders.

Relationship between Net income and Operating Cash Flow: When a company has large net income but poor operating cash flows, it may indicate a company has poor earnings quality i.e.

- Company may be using aggressive accounting choices to inflate net income.
- Company is not generating sufficient cash from operating activities.

In summary, an analyst must assess the following:

- The success or failure of the firm in generating positive operating cash flows.
- The underlying reasons behind positive or negative operating cash flows.
- The magnitude of positive or negative operating cash flow.
- Fluctuations in cash flow from operations over time.

Practice: Example 8, Volume 3, Reading 23.

4.2 Common Size Analysis of the Statement of Cash Flows

There are two alternative approaches:

1. Expressing each line item of cash ***inflow*** (outflow) as a percentage of ***total inflows*** (total outflows) of cash.
2. Expressing each line item of cash flow statement as a percentage of **Net Revenue**.

Note that in indirect-method, cash inflows and outflows are not presented separately; thus, in common-size analysis, the net operating cash flow is expressed as percentage of total inflows or outflows depending on whether the net amount was a cash inflow or outflow.

Uses of common-size cash flow statement analysis:

- It facilitates analysts to observe trends in cash flow.
- It facilitates analysts in forecasting future cash flows of a company.

Practice: Example 9, Volume 3, Reading 23.

4.3 Free Cash Flow to the Firm and Free Cash Flow to Equity

A. Free Cash Flow to the Firm (FCFF): It represents cash available to the company's suppliers of debt and equity capital providers after paying out all operating expenses (including income taxes) and making all necessary investments in working capital and fixed capital i.e.

FCFF = NI + NCC + Int (1 – Tax rate) – FCInv – WCInv

Or

FCFF = CFO + Int (1 – Tax rate) –FCInv

where,

NI = net income
NCC = non-cash charges (i.e. depreciation & amortization)
Int = interest expense
Tax rate = tax expense / pretax income
FCInv = capital expenditures (fixed capital i.e. equipment)
WCInv = working capital expenditures
CFO = cash flow from operating activities under U.S. GAAP.

Under IFRS:

- When a company has classified interest as financing (IFRS), CFO is not adjusted for interest (1 – Tax rate).
- When dividends and interest received are classified as investing, these should be added back to CFO to calculate FCFF.
- When dividends paid are classified as operating activities, they should be added back to CFO to compute FCFF.

B. Free cash flow to equity (FCFE): It represents the cash flow available to the firm's common equity holders after all operating expenses, interest and principal payments have been paid, and necessary investments in working and fixed capital have been made. It is computed as follows:

FCFE = CFO – FCInv + Net borrowing

Or

FCFE = NI + NCC – FCInv – WCInv + Net borrowing

When net borrowing is negative, debt repayments > receipts of borrowed amounts; in this case,

FCFE = CFO – FCInv – Net Debt repayment

4.4 Cash Flow Ratios

Ratio analysis is useful to make comparisons of performance and prospects of different companies in an industry and of different industries.

A. Performance Ratios include:

1) Cash flow to revenue = $\frac{\text{CFO}}{\text{Net revenue}}$
   - It represents operating cash generated per dollar of revenue.
2) Cash return on assets = $\frac{\text{CFO}}{\text{Average Total Assets}}$
   - It represents operating cash generated per dollar of asset investment.
3) Cash return on equity = $\frac{\text{CFO}}{\text{Average Shareholders' equity}}$
   - It represents operating cash generated per dollar of owner investment.
4) Cash to income = $\frac{\text{CFO}}{\text{Operating Income}}$
   - It represents ability of company to generate cash from firm operations.
5) Cash flow per Share = $\frac{\text{CFO} - \text{Preferred dividends}}{\text{Weighted Average Number of Common shares outstanding}}$
   - It represents operating cash flow on a per-share basis.

Under IFRS: If dividends paid are classified as operating activities,

$$\frac{\text{CFO} + \text{dividends paid} - \text{Preferred dividends}}{\text{Number of common shares outstanding}}$$

B. Coverage Ratios include:

1) Debt coverage = $\frac{\text{CFO}}{\text{Total Debt}}$
   - It represents financial risk & financial leverage of a company.
2) Interest coverage = $\frac{\text{CFO} + \text{Interest paid} + \text{Taxes paid}}{\text{Interest paid}}$
   - It represents company's ability to meet interest obligations.

Under IFRS: If interest paid are classified as financing activities, then

$$\frac{\text{CFO} + \text{Taxes paid}}{\text{Interest paid}}$$

3) Reinvestment = $\frac{\text{CFO}}{\text{Cash paid for long-term assets}}$
   - It represents company's ability to acquire assets with operating cash flow.
4) Debt payment = $\frac{\text{CFO}}{\text{Cash paid for long-term debt repayment}}$
   - It represents ability of company to pay debts with operating cash flows.

5) Dividend payment = $\frac{\text{CFO}}{\text{Dividends paid}}$
   - It represents ability of a company to pay dividends with operating cash flows.
6) Investing and Financing = $\frac{\text{CFO}}{\text{Cash outflows for Investing and Financing activities}}$
   - It represents ability of a company to acquire assets, to pay debts and to make distributions to owners with operating cash flows.

Practice: Example 10, Volume 3, Reading 23.

Summary:

Effects of Balance Sheet account changes on Cash

Cash Inflow	Cash Outflow
A decrease in an Asset account	An increase in an Asset account
An increase in a Liability account	A decrease in a Liability account
An increase in an Equity account	A decrease in an Equity account

CASH INFLOWS		
Operating activities	**Investing activities**	**Financing activities**
Collections from customers	Collection of loans	Issuance of long-term debt
Interest income *	Sale of debt securities	Issuance of equity securities
Dividends receipts *	Sale of equity securities	
Other operating cash receipts	Sale of productive assets	

*or investing under IFRS.

CASH OUTFLOWS		
Operating activities	**Investing activities**	**Financing activities**
Payments to suppliers	Making loans	Repayment of debt
Payments to employees	Purchase of debt securities	Repurchase of equity securities
Interest payments *	Purchase of equity securities	Payments of dividends**
Payment of income taxes	Purchase of productive assets	
Other operating cash payments		

* Or Financing under IFRS.
** Or operating under IFRS.

Practice: CFA Institute's end of Chapter Practice Problems and FinQuiz Questions.

1. INTRODUCTION

Financial statement analysis involves analysing the information provided in the financial statements. Financial analytical tools can be used to assess company's:

- Past performance
- Present condition
- Future performance

Sources of data include:

- Company's financial statements
- Notes to financial statements
- Management commentary (operating & financial review or management's discussion and analysis)

Financial statements provide data about the past performance (income, cash flows) and current financial condition (assets, liabilities, equity). However, in order to forecast future results, analysts must use other information available in company's financial reports and information on the economy, industry and comparable companies.

Equity v/s Credit Analysis:

Equity Analysis: It involves an owner's perspective either for valuation or performance evaluation. It is used to assess the ability of a company to generate and grow earnings and cash flows and any risks associated with it. Its focus is on the growth of a company.

Credit Analysis: It involves a creditor's (e.g. banker or bondholder) perspective. Its major focus is to evaluate risks of a company and its long-term cash flows.

2. THE FINANCIAL ANALYSIS PROCESS

An effective analysis includes both computation and interpretation. In order to perform an effective financial statement analysis, an analyst needs to know:

- Purpose & objective of the analysis and steps required to meet those objectives.
- Company's annual report and other sources of information available.
- How to process, analyze the data and communicate the results of analysis.

3. ANALYTICAL TOOLS AND TECHNIQUES

The commonly used tools for financial statement analysis are:

- Financial Ratio Analysis
- Comparative financial statements analysis:
  - Horizontal analysis/Trend analysis
  - Vertical analysis/Common size analysis/ Component Percentages

Ratios and common size financial statements remove size as a factor and thus help in comparing different companies.

For comparison purposes:

- Financial statements reported in different currencies can be translated into a common currency using exchange rate at the end of a period or using average exchange rates.
- For differences in fiscal year end, trailing twelve months data can be used.
- For differences in accounting standards, analysts must make adjustments.

Practice: Example 2, Volume 3, Reading 24.

3.1 Ratios

Ratio analysis involves both interpretation and computation of ratios using information from one or more financial statement(s).

3.1.2) Value, Purposes and Limitations of Ratio Analysis

Uses of ratio Analysis:

Financial statement ratios provide a method of standardization (i.e. it removes/reduces the effect of size), which facilitates comparison across different companies.

Financial statement ratio analysis can be used to evaluate past performance, current financial position and future performance of a company (i.e. predicting future earnings and equity returns).

Financial statement ratios provide information about firm's:

- Economic characteristics i.e. changes in the company or industry over time
- Competitive strategies
- Financial flexibility
- Ability of management
- Peer companies

Financial statement ratios can be used for making investment decisions and in forecasting financial distress of a firm.

Ratios also express relationships between different financial statements.

Limitations of Ratios:

- Heterogeneity or homogeneity of a company's operating activities i.e. when a company has divisions operating in different industries, it is difficult to obtain comparable industry ratios for comparison purposes.
- A ratio is an indicator of some aspect of a company's performance *in the past*. It does not reveal **why** things are as they are. Also a single ratio by itself is not likely to be very useful.
- Ratio analysis may not provide consistent results.
- There is no one definitive set of key ratios and there is no uniform definition for all ratios.
- There are no standard rules regarding the interpretation of financial ratios and they require judgment.
- Differences in accounting policies can distort ratios (e.g. inventory valuation, depreciation methods).
- Not all ratios are necessarily relevant for a particular analysis.
- Financial ratios provide misleading results when companies manipulate or misrepresent their financial information.
- Financial ratios are based on historical results. Thus, they are not always useful to predict future performance.
- It is difficult to determine the target or comparison value for a ratio; thus, analyst has to use some range of acceptable values.

NOTE:

Individual ratio values are not meaningful in isolation. They are only valid when compared to those of other firms or to the company's historical performance.

3.1.3) Sources of Ratios

Ratios can be computed using data from financial statements or from databases i.e. Bloomberg.

- Analysts should consider that database providers use judgment in classifying different items.
- Analysts should assess the consistency of formulas and data classifications used by the data sources.

Practice: Example 3 & 4, Volume 3, Reading 24.

3.2 Common-Size Analysis

Common size financial statements can be used for performing cross sectional and time series analysis because they remove the effects of differences in firm size.

1) **Vertical Common size analysis:** All items are expressed as a percentage of a common base item within a financial statement.
2) **Horizontal analysis** involves comparing a specific financial statement with prior or future periods or to a cross-sectional analysis of a company.

3.2.1) Common-size Analysis of the Balance Sheet

Uses of common size balance sheet:

1) To identify trends in a company's balance sheet components over time.
2) To compare balance sheet components of similar firms e.g. is this firm holding more debt than similar organizations?

A **vertical common size balance sheet** expresses each item on the balance sheet as a percentage of total assets.

It indicates the composition of the balance sheet e.g. increase in A/R as percentage of total assets may indicate:

- Increase in sales on a credit basis.
- Credit standards have been lowered by the company.
- Collection procedures have been relaxed.
- Use of more aggressive revenue recognition policies.

A **horizontal common-size balance sheet** represents the increase or decrease in percentage terms of each balance sheet item from prior year or it can be prepared by dividing each item by a base-year quantity of that item.

- It indicates structural changes in the business.
- It helps in assessing the stability of past trends and chances of change in direction in future.

For example:

Period 1 cash = $39 million
Period 2 cash = $29 million
Period 3 cash = $27 million

- This implies that in period 2, company has 29 / 39 = 0.74 or 74% of the amount of cash it had in period 1.
- In period 3, it has 27 / 39 = 0.69 or 69% of the amount of cash it had in period 1.

Example of percentage change in each item:

Change in cash from Period 1 to 2 = (29 / 39) – 1 = -25.6%

Change in cash from period 2 to 3 = (27 / 29) – 1 = -6.9%.

3.2.2) Common-Size Analysis of the Income Statement

A *common-size income statement* expresses each income statement category as a percentage of total sales or revenues.

3.2.3) Cross-sectional Analysis (a.k.a Relative analysis)

It involves comparing company's performance with another company or group of companies. It removes the effects of differences in firm size and currencies.

3.2.4) Trend Analysis

Trend analysis involves analyzing trends in the data i.e. analyzing whether they are deteriorating or improving. It provides important information regarding historical performance and growth of a company. Analyzing past trends is more useful for stable and mature companies and when macroeconomic and competitive environments are relatively stable.

3.2.5) Relationship among Financial Statements

We can compare the trend data generated by a horizontal common-size analysis across different financial statements e.g. we can compare growth of assets with revenue growth rate i.e. if growth rate of revenue > assets growth rate, it may indicate that company is increasing its efficiency. Similarly, when net income is growing at a faster rate than revenue, it may indicate that company's profitability is increasing. However, it is important to assess whether growth in net income is attributed to continuing operations or non-operating/non-recurring items.

Practice: Example 5, Volume 3, Reading 24.

NOTE:

When the company grows at a rate greater than that of the overall market in which it operates, it is regarded as a positive sign and indicates that the company is easily able to attract equity capital.

3.3 The Use of Graphs as an Analytical Tool

1) Graphs facilitate in comparing performance and financial structure of a company over time.
2) Graphs help to identify significant aspects of business operations.
3) Graphs provide a graphical overview of risk trends of a business.
4) Graphs can be used to communicate conclusions regarding financial condition and risk management aspects of a firm.

Pie Charts: Pie charts can be used to show the composition of a total value.

Line Graphs: Line graphs can be used to present the change in amounts for a limited number of items over a relatively longer time period. They also illustrate growth trends in key financial variables.

Stacked Column Graph: Stacked column graph can be used to present the composition, amounts and changes in amounts over time.

3.4 Regression Analysis

Regression analysis can be used to identify relationships (correlation) between variables.

- For example, in order to evaluate whether the company is cyclical or non-cyclical, regression analysis can be used to identify relationship between company's sales and GDP over time.
- Regression analysis is also helpful in predicting future.

4. COMMON RATIOS USED IN FINANCIAL ANALYSIS

Financial Ratios can be classified into five main categories:

1) **Activity Ratios:** Activity ratios measure the efficiency of managing assets in day-to-day operations i.e. how effectively assets are being used by the company e.g. collection of A/R and inventory management etc.

2) **Liquidity ratios:** Liquidity ratios measure firm's ability to meet short-term obligations. They also measure how quickly assets are converted into cash.

3) **Solvency ratios:** Solvency ratios measure firm's ability to meet long-term obligations. They include leverage and long-term debt ratios.

4) **Profitability ratios:** Profitability ratios measure the overall performance and profitability of the firm.

5) **Valuation ratios:** Valuation ratios measure the amount of an asset or earnings associated with ownership of a specified claim e.g. share or ownership of the enterprise.

Note that these categories are not distinct i.e. activity ratios also indicate liquidity of a company because collection of A/R results in increase in cash. Similarly, some profitability ratios also reflect operating efficiency of a firm.

4.1 INTERPRETATION AND CONTEXT

Financial ratios are used in:

- Cross-sectional analysis i.e. comparing ratios of a firm with those of its major competitors.
- Trend analysis i.e. comparing ratios of a firm with its prior periods.

Financial Ratios should be evaluated based on the following factors:

1. Company goals and strategy: Ratios should be compared with the company's goals & strategy.
2. Industry norms or Cross-sectional analysis and Trend analysis i.e. comparing ratios of a firm with those of its major competitors.
3. Economic conditions: Ratios should be evaluated by considering the current phase of business cycle e.g. for cyclical companies, financial ratios tend to improve (deteriorate) when the economy is strong (weak).

4.2 Activity Ratios

Activity ratios are also known as asset utilization ratios or operating efficiency ratios.

$$\textbf{Inventory Turnover Ratio} = \frac{\text{COGS}}{\text{Average Inventory}}$$

- It measures the efficiency of the firm in managing and selling inventory.
- High ratio represents efficient inventory management i.e. fewer funds tied up in inventories.
- High inventory can also indicate under-stocking and lost orders.
- Slower growth combined with higher inventory turnover may indicate inadequate inventory levels.
- Low turnover can also indicate valid reasons i.e. preparing for a strike, increased demand, etc.

NOTE:

- Quarterly turnover ratio can be annualized as follows: Quarterly turnover ratio × (12 / 3) or Quarterly turnover ratio × (365 / 90).
- In case of rapidly increasing costs, COGS for the 4th quarter should be used.

Days of Inventory on hand (DOH) = Average # of days inventory in stock $= \frac{365}{\text{Inventory Turnover Ratio}}$

- Low ratio represents efficient inventory management.
- Low ratio can also indicate under-stocking and lost orders.

Receivable Turnover Ratio= $\frac{\text{Sales or Revenue}}{\text{Average receivables}}$

- Relatively low turnover ratio may indicate inefficiency, decrease in demand, or earnings manipulations.

NOTE:

When available, credit sales should be used instead of net sales since credit sales produce the receivables.

Days of Sales Outstanding (DOS) = Average # of days receivable are outstanding $= \frac{365}{\text{Receivable Turnover}}$

- It provides information about the firm's credit policy.
- It should be compared with the firm's stated credit policy i.e., if firm policy is 30 days and average collection period is 60 days, it indicates that company is not stringent in collection effort.
- It should be compared with that of industry i.e. low ratio relative to the industry may indicate efficient credit and collection; however, it may also indicate loss sales to competitors.

Payable Turnover Ratio $= \frac{\text{Purchases}*}{\text{Average trade payables}}$

- This ratio reflects how many times per year the company pay off all its creditors.
- High ratio (or low days payable) relative to industry may indicate that company is not making full use of available credit facilities or it may also indicate that company is taking advantage of early payment discounts.
- Low ratio (or high days payable) may indicate that company is facing problems in making payments on time or it may indicate that company is exploiting lenient supplier terms.

*when not directly available, Purchases = COGS + Ending inventory – beginning inventory or we can use COGS.

Number of Days of Payables= $\frac{365}{\text{Payable Turnover}}$

- This ratio reflects the average number of days the company takes to pay its suppliers.

Working Capital Turnover = $\frac{\text{Revenue}}{\text{Average Working Capital}}$

where,

Working capital = Current assets – Current liabilities.

- Working capital turnover reflects the company's efficiency in generating revenue from its working capital.
- Higher ratio indicates greater efficiency.
- When this ratio is zero or negative, it is meaningless to interpret.

Fixed Assets Turnover Ratio = $\frac{\text{Sales or Revenues}}{\text{Average net fixed assets}}$

- It is a measure of the relation between sales and investments in long-lived assets.
- Fixed assets turnover reflects the company's efficiency in generating revenue with its investments in fixed assets.
- Higher ratio indicates greater efficiency.
- Lower ratio indicates inefficiency.
- Lower ratio may also indicate that the company has newer assets (i.e. reported at higher carrying value on B/S due to lower depreciation expense).

Total Assets Turnover Ratio = $\frac{\text{Sales}}{\text{Average total assets}}$

- Total assets turnover reflects the company's overall efficiency in generating revenue with its given level of assets.
- Higher ratio indicates greater efficiency.
- When the asset turnover ratios are low, relative to the industry or historical record, it indicates inefficiencies or it may indicate that either the investment in assets is too heavy and/or sales are slow, or it may be possible that the firm may have taken an extensive plant modernization.

NOTE:

Average can be computed as follows:

- For annual data, average can be taken over two data points i.e. beginning & ending of year.
- For semi-annual data, average can be taken over three data points i.e. beginning, middle & ending of year.
- For quarterly data, average can be taken over 5 data points i.e. beginning of year and end of each quarter or for 4 data points i.e. end of each quarter.

Practice: Example 6, 7 & 8, Volume 3, Reading 24.

4.3 Liquidity Ratios

Following Liquidity ratios reflect company's liquidity position at a specific point in time.

Cash Conversion Cycle: It reflects the number of days a company's cash is tied up by its current operating cycle. It is calculated as follows:

Cash Conversion Cycle or Net Operating cycle = Number of days inventory in stock + Number of days receivable are outstanding – Number of days accounts payable are outstanding = DOH + DSO - Number of days accounts payable are outstanding

- A short cash conversion cycle indicates a higher level of liquidity.

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

- A higher ratio indicates a higher level of liquidity.

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

- A higher quick ratio indicates a higher level of liquidity.
- The quick ratio is more conservative relative to current ratio because it includes only the more liquid current assets i.e. it ignores inventory. Therefore, in situations when inventories are illiquid, quick ratio is a better indicator of liquidity compared to current ratio.

Cash Ratio = $\frac{\text{Cash + Marketable securities}}{\text{Current Liabilities}}$

- A higher ratio indicates a higher level of liquidity.
- It is a better indicator of liquidity in case of crisis situation.

Defensive Interval ratio=

$$\frac{\text{Cash} + \text{Marketable Securities} + \text{Accounts Receivables}}{\text{Daily Cash Expenditures} *}$$

- It reflects how long a company is able to pay off its daily cash expenses using only its existing liquid assets without any additional cash inflow.
- A higher ratio indicates a higher level of liquidity.

*Daily expenditures = total cash expenditures / number of days in a period

where,

Total cash expenditures = sum of all expenses on I/S (e.g. COGS, general, and administrative expenses, R&D) – non-cash expenses (e.g. depreciation & amortization (without taxes))

Practice: Example 9 & 10, Volume 3, Reading 24.

4.4 Debt & Solvency Ratios

Debt Financing and Coverage

The use of debt involves risk because debt involves fixed commitment (interest charges & principal repayment). However, use of debt also introduces the potential for increased benefits to the firm's owners.

Operating leverage: It arises from usage of fixed costs in conducting the company's business. Operating leverage tends to ***magnify*** the effect of changes in sales on operating income of a company. Profitable companies may use operating leverage because when revenues ↑, their operating income ↑ at a higher rate because of operating leverage.

- Greater the operating leverage, greater the risk and lower will be a company's capacity to use financial leverage.

Financial leverage: It arises due to use of debt. Financial leverage tends to magnify the effect of changes in EBIT on equity holders returns.

- When return earned by a company > cost of debt, use of debt leads to decrease in overall cost of capital of a company; thus, increases returns to equity-holders.
- Evaluating company's use of debt helps analysts to understand company's future business prospects e.g. the issuance of long-term debt to repurchase common shares may indicate that according to company's management, shares of company are undervalued.
- It must be stressed that use of high financial leverage (i.e. greater debt financing) is regarded as less risky for companies with steady cash flows compared to companies with volatile cash flows.

4.4.1) Calculation of Solvency Ratios

Solvency Ratios:

$$\textbf{Debt-Capital Ratio} = \frac{\text{Total Debt}*}{\text{Total Debt} + \text{Total Shareholders' Equity}}$$

- It measures the percentage of a company's capital (debt + equity) represented by debt.
- Higher the ratio, greater the financial risk of a company and weaker the solvency position.

$$\textbf{Debt – Assets (or Total Debt) Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

- It reflects the percentage of total assets financed with debt.
- Generally, higher the debt, greater the financial risk of a company and weaker the solvency position.

$$\textbf{Debt-Equity Ratio} = \frac{\text{Total Debt}*}{\text{Total Shareholders' equity}}$$

- It measures the amount of debt capital relative to equity capital.
- Higher the ratio, greater the financial risk of a company and weaker the solvency position.

*Debt = *interest-bearing short-term debt + long-term debt, excluding liabilities such as accrued expenses and accounts payable*

$$\textbf{Financial Leverage Ratio (or Leverage Ratio)} = \frac{\text{Average Total Assets}}{\text{Average Total Shareholders' equity}}$$

- It measures the amount of total assets supported by one money unit of equity.
- Higher ratio indicates greater amount of debt and thus, weaker solvency.

Coverage Ratios:

$$\textbf{Interest Coverage (or Times interest earned)} = \frac{\text{Operating profit (EBIT)}}{\text{Interest payments}}$$

- It reflects the number of times a company is able to pay off its interest payments (service its debt) with its EBIT (operating income).
- Higher ratio indicates stronger solvency.

$$\textbf{Fixed charge coverage} = \frac{\text{EBIT} + \text{Lease payments}}{\text{Interest Payments} + \text{Lease payments}}$$

- It reflects the number of times a company is able to pay off its interest and lease payments with its earnings (before interest, taxes and lease payments).
- Higher ratio indicates stronger solvency.
- The ratio also indicates quality of the preferred dividend i.e. a higher ratio indicates a more secure preferred dividend.

NOTE:

Lease payments are added to numerator because they were deducted to calculate operating profits.

Practice: Example 11, Volume 3, Reading 24.

4.5 Profitability Ratios

Profitability ratios reflect profit (return) earned by the company *during* a period.

4.5.1) Calculation of Profitability Ratios

Return on sales Profitability Ratios: These ratios measure income relative to revenues and include:

$$\textbf{Gross Profit Margin} = \frac{\text{Gross profit}}{\text{Revenue}}$$

- It reflects the percentage of revenue available to pay operating and other expenses and to generate profit.
- It measures the ability of the firm to control costs of inventories and/or manufacturing cost and the ability to pass increases in input price to customers through sales.
- Higher gross profit margin indicates higher profit either due to higher product pricing or lower product costs or both.
- Gross profit is inversely related to competition in the industry i.e. greater the competition, lower will be the ability to charge a higher price and lower the gross profit.

$$\textbf{Operating Profit Margin} = \frac{\text{Operating income}}{\text{Revenue}} = \frac{\text{Gross profit} - \text{operating costs}}{\text{Revenue}}$$

- When operating profit margin > gross profit margin, it indicates improvements in controlling operating costs i.e. administrative overheads.

$$\textbf{Pre-tax margin} = \frac{\text{EBT (earnings before tax but after interest)}}{\text{Revenue}}$$

- It reflects impact of leverage and other non-operating income & expenses on profitability of a company.

$$\textbf{Net Profit Margin} = \frac{\text{Net Income}}{\text{Revenue}}$$

- It measures overall profitability of the firm taking into account all items i.e. revenues, expenses, tax, interest, etc.
- It also indicates the firm's ability to control the level of expenses relative to revenues generated.

Return on Investment Profitability Ratios: These ratios measure income relative to assets, equity or total capital of a company. These include:

$$\textbf{Operating ROA} = \frac{\text{Operating inome}}{\text{Average Total Assets}}$$

- It indicates company's profitability and efficiency in using assets to generate operating profits. Higher the ratio, better it is.

$$\textbf{Rate of return on assets (ROA)} = \frac{\text{Net income}}{\text{Average Total Assets}*}$$

- ROA measures the return earned by a company on its assets.
- The higher ratio indicates that more income is generated by a given level of assets.

*ending or beginning assets can also be used.

- When a company has stable level of assets, all three measures of assets will provide almost same result.
- When level of assets are not stable i.e. growing or shrinking, the results will differ among the three measures.
- Generally, rule is to use **average** when the numerator of the ratio represents a number from income statement or cash flow statement and denominator of a ratio represents a number from balance sheet.
- For simplicity, average of the beginning and ending balance sheet amounts is taken. However, for a company with seasonal business, it is better to use average of interim periods (if available).

$$\textbf{Rate of return on Assets (ROA)} = \frac{\text{Net income} + \text{Interest expense } (1 - \text{tax rate})}{\text{Average Total Assets}}$$

- This ratio provides a performance measure that is independent of the financing of the firm's assets.

$$\textbf{Return on Total Capital} = \frac{\text{EBIT}}{\text{Short-term and long-term debt \& } equity}$$

- It measures the profit earned by a company on all of its capital employed.

$$\textbf{Return on Shareholders' Equity (ROE)} = \frac{\text{Net income}}{\text{Average Total Shareholders' Equity}}$$

- It measures the return earned by a company on its equity (i.e. common equity, preferred equity and minority equity).

$$\textbf{Rate of Return on Common Shareholders' Equity (ROE)} = \frac{\text{Net income} - \text{preferred dividends}*}{\text{Average Common Equity}}$$

*because preferred dividends are a return to preferred equity

- It measures the return earned by a company on its common equity only.

Practice: Example 12, 13 & 14, Volume 3, Reading 24.

4.6.2) DuPont Analysis: The Decomposition of ROE

DuPont analysis facilitates an analyst to evaluate the impact of leverage, profit margins, and turnover on shareholder returns, determine the reasons for changes

in ROE over time for a given company and for different companies in a given time period.

- The decomposition reflects ROE as a function of company's efficiency, operating profitability, taxes, and use of financial leverage.

Two variants of the DuPont analysis:

1) The original three-part approach
2) Extended five part system.

$$\text{ROA} = \frac{\text{Net income}}{\text{Average total Assets}} = \frac{\text{Net income}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average total Assets}} = \text{Net profit margin} \times \text{Total asset turnover}$$

$$\text{ROE} = \frac{\text{Net income}}{\text{Average total Equity}} = \frac{\text{Net Income}}{\text{Average total Assets}} \times \frac{\text{Average total Assets}}{\text{Average total Equity}} = \text{ROA} \times \text{Leverage}$$

- When a company has no leverage, **ROE = ROA.**
- When borrowing rate < (>) marginal rate earned on investing the borrowed money in business, ROE would increase (decrease) as leverage increases.

Three component disaggregation of ROE

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average total Equity}} = \frac{\text{Net income}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average total Assets}} \times \frac{\text{Average total Assets}}{\text{Average total Equity}}$$

= Net profit margin × Total asset turnover × Leverage

Five component disaggregation of ROE:

$$\text{ROE} = \frac{\text{Net Income}}{\text{Average total Equity}} = \frac{\text{Net income}}{\text{EBT}} \times \frac{\text{EBT}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Average total Assets}} \times \frac{\text{Average total Assets}}{\text{Average total Equity}}$$

= Tax burden × Interest burden × EBIT margin × Total asset turnover × Leverage

- A higher value for the tax burden indicates a lower tax rate i.e. the company is able to retain a higher percentage of its pre-tax profits.
- Higher value of interest burden indicates lower borrowing costs (i.e. lower interest payments). Lower borrowing costs result in increase in ROE.
- EBIT margin reflects effects of operating margin on ROE.

NOTE:

EBIT margin can be decomposed into a non-operating component (EBIT/ Operating income) and an operating component (Operating income/ Revenue).

Practice: Example 15 & 16, Volume 3, Reading 24.

5. EQUITY ANALYSIS

Methods used by analysts to estimate equity value of a company:

- Valuation ratios (e.g. the price-to-earnings or P/E ratio)
- Discounted cash flow approaches
- Residual income approaches (ROE compared with the cost of capital)

Ratios used in equity analysis include:

1. **Price-to-earnings** $= \frac{\text{Price per share}}{\text{Earnings per share}}$

- It reflects how much an investor in common stock pays per dollar of earnings.
- Due to use of net income, this ratio can be sensitive to non-recurring earnings.

2. **Price-to-cash flow** $= \frac{\text{Price per share}}{\text{Cash flow per share}}$
3. **Price-to-sales** $= \frac{\text{Price per share}}{\text{Sales per share}}$
4. **Price-to-book value** $= \frac{\text{Price per share}}{\text{Book value per share}}$

- This ratio reflects relationship between a company's required rate of return and its actual rate of return.
- A ratio > 1 (< 1) would indicate that the future profitability of the company is expected to be greater (less) than the required rate of return.

Basic EPS $= \frac{\text{Net income} - \text{preferred dividends}}{\text{weighted average number of ordinary shares outstanding}}$

- It is not an appropriate measure for comparison purposes e.g. differences in EPS does not indicate differences in profitability among companies because companies may have identical profits, and differences in EPS only reflects differences in

number of common shares outstanding.

Diluted EPS =

Net income available for ordinary shares after adjustments made for conversion of dilutive securities / weighted average number of ordinary and potential ordinary shares outstanding

NOTE:

Calculations are discussed in Detail in Reading 25, section 6.

Cash flow per share = $\frac{\text{Cash flow from operations}}{\text{weighted average number of shares outstanding}}$

EBITDA per share = $\frac{\text{EBITDA}}{\text{weighted average number of shares outstanding}}$

- It can be used to remove the effect of different levels of fixed asset investment across companies.

Dividends per share =

$\frac{\text{Common dividends declared}}{\text{weighted average number of ordinary shares outstanding}}$

Dividend payout ratio = $\frac{\text{Common share dividends}}{\text{Net income attributable to common shares}}$

- It measures the percentage of earnings that the company pays out as dividends to shareholders.

Retention rate (b) =

$\frac{\text{Net Income attributable to common shares} - \text{Common share dividends}}{\text{Net income attributable to common shares}}$

- It reflects the percentage of earnings that the company retains.

Sustainable growth rate of a firm: A firm's sustainable growth rate can be calculated as follows:

Sustainable growth rate = Earnings Retention Rate (b)× ROE

5.2 Industry-Specific Ratios

Business Risk can be measured by following ratios:

Coefficients of variation: It is used to measure the risk related to a firm's sales, operating income, and net income.

1) Coefficients of variation of Operating income =

$\frac{\text{S.D of operating income}}{\text{Average operating income}}$

2) Coefficients of variation of Net income =

$\frac{\text{S.D of Net income}}{\text{Average Net income}}$

3) Coefficients of variation of Revenues = $\frac{\text{S.D of Revenue}}{\text{Average Revenue}}$

Financial Sector Ratios include:

1) Capital adequacy (for banks) =

Various components of capital / various measures i.e. risk-weighted assets, market risk exposure, level of operational risk assumed

2) Monetary reserve requirements (Cash reserve ratio):

$\frac{\text{Reserve held at central bank}}{\text{specified deposit liabilities}}$

3) Liquidity asset requirement =

$\frac{\text{Approved "readily marketable" securities}}{\text{specified deposit liabilities}}$

4) Net Interest Margin = $\frac{\text{Net Interest Income}}{\text{Total interest-earning assets}}$

Retail Ratios:

1) Same or comparable store sales = Average revenue growth year over year for stores open in both periods

2) Sales per square meter (or square foot) =

$\frac{\text{Revenue}}{\text{Total retail space in square meters (or sqaure feet)}}$

Service Companies:

1) Revenue per employee = $\frac{\text{Revenue}}{\text{Total number of employees}}$

2) Net income per employee = $\frac{\text{Net income}}{\text{Total number of employees}}$

Hotel:

1) Average daily rate = $\frac{\text{Room revenue}}{\text{Number of rooms sold}}$

2) Occupancy rate = $\frac{\text{Number of rooms sold}}{\text{Number of rooms available}}$

6. CREDIT ANALYSIS

Credit analysis refers to evaluating credit risk. It involves:

- Projecting period-by-period cash flows of a firm.
- Credit scoring i.e. a statistical analysis of the determinants of credit default.

Ratios used in credit analysis include:

1. **EBIT interest coverage** =

$\frac{\text{EBIT}}{\text{Gross interest (prior to deduction for capitalized interest or interest income)}}$

2. **EBITDA interest coverage** = $\frac{\text{EBITDA}}{\text{Gross interest (prior to deduction for capitalized interest or interest income)}}$

3. **FFO (Funds from Operations) interest coverage** = $\frac{\text{FFO+interest paid−operating lease adjustments}}{\text{Gross interest (prior to deductions for capitalized interest or interest income)}}$

4. **Return on capital** = $\frac{\text{EBIT}}{\text{Average capital}}$ = $\frac{\text{EBIT}}{\text{Equity+Non current deferred taxes+Debt}}$

5. **FFO* (Funds from Operations) to debt** = $\frac{\text{FFO}}{\text{Total debt}}$

*FFO = net income adjusted for non-cash items.

6. **Free operating cash flow to debt** = $\frac{\text{CFO (adjusted)− capital expenditures}}{\text{Total debt}}$

7. **Discretionary cash flow to debt** = $\frac{\text{CFO− capital expenditures−Dividend paid}}{\text{Total debt}}$

8. **Net cash flow to capital expenditures** = $\frac{\text{FFO−dividends}}{\text{Capital expenditures}}$

9. **Debt to EBITDA** = $\frac{\text{Total debt}}{\text{EBITDA}}$

10. **Total debt to total debt plus equity** = $\frac{\text{Total debt}}{\text{Total debt+Total equity}}$

7. BUSINESS AND GEOGRAPHICAL SEGMENTS

Segment Analysis: In order to perform more detail analysis of a company's financial performance, analysts should analyze business segments and geographic segments separately.

7.1 Segment Reporting Requirements

- Companies are required to provide segment information under both IFRS and U.S. GAAP.
- A company is required to disclose separate information about any operating segment which meets certain quantitative criteria i.e. the segment constitutes 10% or more of the combined operating segment's revenue, assets, or profit.
- Information about smaller operating segments and businesses (that are not reported separately) is combined in "all other segments" category.
- Companies are required to:
  - Disclose the factors used to identify reportable segments and the types, products and services sold by each reportable segment.
  - Provide reconciliation between information of reportable segments and consolidated financial statements in terms of the revenue, profit/loss, assets and liabilities.
  - Disclose company's reliance on any single customer i.e. when a single customer represents 10 % or more of the company's total revenues. Note that more concentrated customer base a company has, greater the risks.

7.2 Segment Ratios

1) **Segment margin** = $\frac{\text{Segment Profit (loss)}}{\text{Segment Revenue}}$

- It measures the operating profitability of the segment relative to revenues.

2) **Segment turnover** = $\frac{\text{Segment Revenue}}{\text{Segment Assets}}$

- It measures the overall efficiency of the segment i.e. amount of revenue generated per unit of assets.

3) **Segment ROA** = $\frac{\text{Segment Profit (loss)}}{\text{Segment Assets}}$

- It measures operating profitability of the segment relative to assets.

4) **Segment debt ratio** = $\frac{\text{Segment Liabilities}}{\text{Segment Assets}}$

- It reflects the solvency of the segment i.e. higher the ratio, greater the level of liabilities and weaker the solvency.

Practice: Example 17, Volume 3, Reading 24.

8. MODEL BUILDING AND FORECASTING

Ratio analysis along with other techniques can be used to construct pro-forma financial statements; based on a forecast of sales growth and assumptions regarding the relation between changes in key items of income statement and balance sheet items and growth of sales.

Techniques of Forecasting include:

Sensitivity Analysis: It is also known as 'what-if' analysis. It shows the effects of changes in any one input variable at a time and provides a range of possible outcomes based on those changes.

Scenario analysis: It can be used to examine several possible situations (e.g. worst case, base case or best case) and provides a range of outcomes based on ***simultaneous*** changes in key financial variables.

Simulation: It is an advanced form of scenario analysis. It involves using computer to make random choices for each variable input. Each event or possible outcome is assigned a predetermined probability. Using these probabilities, a probability distribution is obtained which is used to estimate risky outcomes and to calculate the expected return and standard deviation.

Practice: CFA Institute's end of Chapter Practice Problems and FinQuiz Questions.