# Financial Reporting and Analysis

## CFA一级培训项目

讲师：纪慧诚

101% Contribution Breeds Professionalism



## 纪慧诚

- **工作职称：**金程教育金融研究院资深培训师
- **教育背景：**金程教育Excel金融建模、量化投资(AQF)课程开发负责人
- **工作背景：**金融行业从业经验丰富，曾先后就职于中国建设银行、中信证券等知名金融机构。对企业IPO、投资理财、量化投资等领域有着深入的研究和独到的见解。
- **服务客户：**中国工商银行、中国银行、中国建设银行、上海银行、兴业银行、中国人民银行研究生部、兴业证券、平安证券、南京证券、湘财证券、上海证券交易所、深圳综合开发研究院、山东省银行同业协会、中国CFP标准委员会、杨浦区党校、太平洋保险、泰康人寿、中国人寿、人保资产管理、中国平安、华夏基金
- **主编出版：**参与金程CFA项目各类参考书目的编写工作，包括翻译CFA协会官方参考书《企业理财》，《国际财务报告分析》，金程CFA中文Notes等





## Topic Weightings in CFA Level I

| Session NO. | Content | Weightings |
|---|---|---|
| Study Session 1 | Ethical and Professional Standards | 15 |
| Study Session 2-3 | Quantitative Methods | 12 |
| Study Session 4-5 | Economics | 10 |
| **Study Session 6-9** | **Financial Reporting and Analysis** | **20** |
| Study Session 10-11 | Corporate Finance | 7 |
| Study Session 12 | Portfolio Management | 7 |
| Study Session 13-14 | Equity | 10 |
| Study Session 15-16 | Fixed Income | 10 |
| Study Session 17 | Derivatives | 5 |
| Study Session 18 | Alternative Investments | 4 |

# Framework

## F.R.A

- **SS7**
  - R21: Financial Statement Analysis: An Introduction
  - R22: Financial Reporting Mechanics
  - R23: Financial Reporting Standards
- **SS8**
  - R24: Understanding the I/S
  - R25:Understanding the B/S
  - R26: Understanding the C/F
  - R27: Financial Analysis Techniques
- **SS9**
  - R28: Inventories
  - R29: Long-Lived Assets
  - R30: Income Taxes
  - R31: Long-Term Liabilities and Leases
- **SS10**
  - R32: Financial Reporting Quality
  - R33: Financial Statement Analysis: Applications





# Reading 21

**Financial Statement Analysis: An Introduction**





# Financial statements

| Financial position | Financial performance | Change in financial position |
|---|---|---|
| The balance sheet | The income statement | The cash flow statement |
| **Assets = liabilities + owner's equity** | **•Revenue<br>•Expenses<br>↓<br>Net income** | **•Operating cash flows<br>•Investing cash flows<br>•Financing cash flows<br>↓<br>Net cash inflow or outflow for the financial year** |

**The statement of changes in owner's equity**

## Financial statements

- **Measurement of financial elements**
  - **Historical cost**
    - ✓ The amount of cash or cash equivalents paid to purchase an asset, including any costs of acquisition and/or preparation.
  - **Amortized cost**
    - ✓ Historical cost adjusted for depreciation, amortization, depletion, and impairment.
  - **Current cost**
    - ✓ The amount the firm would have to pay today for the same asset.
  - **Realizable value**
    - ✓ The amount for which the firm could sell the asset or settlement of obligation
  - **Present value**
    - ✓ The discounted value of the asset's expected future cash flows.
  - **Fair value**
    - ✓ The amount at which two knowledgeable, willing parties in an arm's-length transaction would exchange the asset.





## Statement of comprehensive income

- **Statement of comprehensive income**
  - Report all items that impact owners' equity but are **not** the result of transactions with shareowners.
  - Under IFRS the statement of comprehensive income can be presented as
    - ✓ A single statement of comprehensive income combining income statement and other comprehensive income;
    - ✓ Two statements
      - ◆Income statement;
      - ◆Statement of comprehensive income that begins with profit or loss from the income statement.
  - OCI presented in the statement of changes in equity (Permitted in GAAP).
- **The statement of changes in equity** (statement of changes in owners' equity or statement of changes in shareholders' equity).
  - Primarily report changes in the owners' investment in the business over time.





## Other relevant information

| Other relevant information | |
|---|---|
| **Financial Notes and Supplementary Schedules★** | Fiscal period; consolidation basis; accounting methods, assumptions and estimates; **explanatory information** about every line item on FSs<br>Note disclosures include information about the following:<br>● financial instruments and risks arising from financial instruments;<br>● commitments and contingencies;<br>● related-party transactions;<br>● subsequent events;<br>● business acquisitions and disposals. |
| **Management's Discussion and Analysis(MD&A)★** | **General contents** (Publicly held companies): nature of the business, past results, material uncertainty and future outlook;<br>**Characteristic**: MD&A is a good for understanding information in the financial statements. In particular, the forward-looking disclosures in an MD&A, can be useful in projecting a company's future performance. |

## Other relevant information

| Framework for (MD&A) | |
|---|---|
| **IASB (guidance)** | ● Nature of the business;<br>● Management's objectives and strategies;<br>● Company's significant resources, risks, and relationships;<br>● Results of operations;<br>● Critical performance measures. |
| **Proxy statements** | ● Management compensation; stock performance; potential conflict of interests;<br>● Matters that are to be put to a vote at the company's annual (or special) meeting of shareholders. |





## Other relevant information

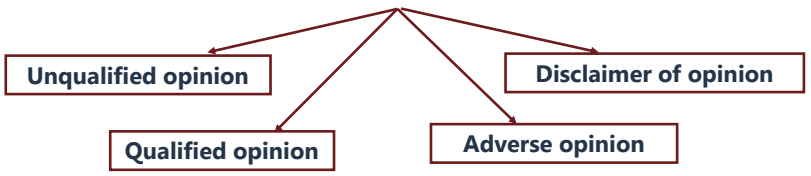
| | |
|---|---|
| **Interim reports** | ● Provided semiannually or quarterly;<br>● Present the four basic financial statements and condensed notes but are not audited;<br>● Provide updated information since the last annual period. |
| **Earnings announcements** | ● Followed by a conference call held by senior executives;<br>● Describe the company's performance and answer questions posed by conference call participants. |
| **External sources** | ● Economy, the industry, the company, and peer (comparable) companies;<br>● External information is helpful in assessing the company's future. |





## Auditor's report

| The Standard Auditor's Opinion | |
|---|---|
| 1 | Although managements have the duty to prepare financial statements, auditor need **to review** the financial statements **independently**. |
| 2 | **Generally accepted auditing standards** reasonably **ensure no material errors** in the financial statements. |
| 3 | The auditor ensured that the financial statements are complied with **accounting principles and that the selection of principles and estimates are on reasonable base.** |
| **Results** | |




**Financial Reporting Mechanics**





## Financial statement elements

- **Financial statement elements** are the major classifications of **assets, liability , owners' equity, revenue and expenses.**
- **Accounts** record specific business transactions within each element.
  - On the financial statements, accounts are typically presented in groups such as "inventory" or "accounts payable."
- A company's **chart of accounts** is includes far more details than those presented in financial statements;
- **Contra accounts** are used for entries that offset some part of the value of another account.
  - Accumulated depreciation——Property, plant and equipment
  - Bad debt allowance——Account receivable
  - Valuation allowance——Deferred tax asset





## Financial statement elements

- **Owners' equity ( Residual claim/net asset )** is the owners' residual claim on a firm's resources, which is the amount by which assets exceed liabilities. Owners' equity includes:
  - **Capital**. Par value of common stock;
  - **Additional paid-in capital.** The amount collected from shareholders than proceeds from par value;
  - **Retained earnings**. Cumulative net income that has not been distributed as dividends.
  - **Other comprehensive income**.
    - ✓ Changes resulting from foreign currency translation,
    - ✓ Minimum pension liability adjustments,
    - ✓ Unrealized gains and losses from cash flow hedging derivatives,
    - ✓ Unrealized gains and losses from available- or-sale.

## Financial statement elements

- **Expenses are outflows of economic resources and include:**
  - **Cost of goods sold;**
  - **Selling, general, and administrative expenses.** These include such expenses as advertising, management salaries, rent, and utilities;
  - **Depreciation and amortization.** The distributed amount of some fixed assets over their life time;
  - **Tax expense;**
  - **Interest expense;**
  - **Losses.** asset outflows not directly related to ordinary businesses.





## Accounting equation

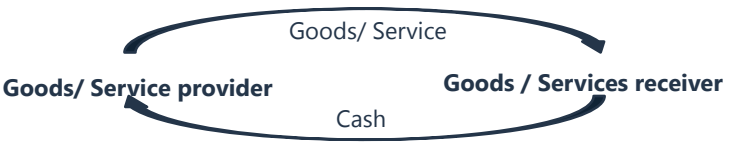
- **Accounting equation**
- **Basic formula:**
  - **Asset=Liability + Equity**
  - **Expansion of the formula:**
    - ✓ **Ending retained earnings** = Beginning retained earnings
      + Net income
      – Dividend
    - ◆Net income = Revenue – Expense

| |
|---|
| Assets = Liabilities<br>+ Contributed capital<br>+Beginning retained earnings<br>+ Revenue<br>- Expenses<br>- Dividend |





## Accrual accounting




| | |
|---|---|
| **Cash received in advance** | **Cash paid in advance** |
| Unearned revenue | Prepaid expense |
| **Cash received in arrears** | **Cash paid in arrears** |
| Accrued revenue | Accrued expense |

# Reading 23

**Financial Reporting Standards**





## SEC filings required

- **SEC filing requirements for publicly traded companies in the U.S.**
  - Form S-1
    - ✓ Registration statement filed prior to the sale of new securities to the public.
  - **Form 10-K**
    - ✓ Annual financial statements.
  - **Form 10-Q**
    - ✓ Quarterly financial statements .
  - Form DEF-14A
    - ✓ Proxy statements.





## SEC filings required

- **SEC filing requirements for publicly traded companies in the U.S.**
  - **Form 8-K**
    - ✓ Material events relating to
      - ◆Significant assets acquisition and disposal.
      - ◆Changes in management or corporate governance.
  - **Form 144**
    - ✓ Issue securities to certain qualified buyers without registering with SEC but notifying.
  - Forms 3,4,5
    - ✓ The beneficial ownership of securities by a company's officers and directors.

## IASB conceptual framework

### Reporting Elements

**Qualitative Characteristics**

**Objective**
To provide financial information useful making decisions about providing resources to the entity.

- **Relevance**
- **Faithful representation**
- **Comparability**
- **Verifiability**
- **Timeliness**
- **Understandability**

- **Performance**
  - ➢ **Income**
  - ➢ **expenses**
  - ➢ **Capital maintenance adjustments**
  - ➢ **Past cash flows**
- **Financial Position**
  - ➢ **Assets**
  - ➢ **Liabilities**
  - ➢ **Equity**

**Constraint**
- **Cost cost/benefit considerations**

**Underlying assumption**
- **Accrual basis**
- **Going concern**





## Barriers to coherent

- ➢ **Valuation**
  - Different measures of the value of asset and liabilities. Historical cost valuation requires minimal judgment. Fair value, require considerable judgement but can provide more relevant information.
  - **IFRS**
    - ✓ **Principles-based approach**, which provides broad framework without specific guideline, thus requiring considerably judgments.
  - **U.S. GAAP**
    - ✓ **Rules-based approach,** but is currently shifting towards an **objectives-oriented approach**.
      - ◆**Rules-based approach**. Set rules for the record of every single transaction.
      - ◆**Objectives-oriented approach**. Combine two approaches.





# Reading 24

**Understanding Income Statement**

## Income statement components

- **Net income =(revenues - ordinary expenses) + (other income - other expense) + (gains – losses)**
- **Revenues (sales)** are generated from selling goods or service in routine business activities.
  - **Net Revenue** = Revenue - adjustments (e.g., cash discounts, volume discounts, or estimated returns);
  - Warranties provided by firms will be expensed (warranty expenses) when incurred.
- **Expenses** are the amounts incurred to generate revenue, such as COGS, operating expense, interest expense, etc.
  - **By nature**
    - ✓ Depreciation expenses are displayed in one account regardless of whether they come from manufacturing or administration.
  - **By function** (cost of sales method)
    - ✓ Cost of goods sold is composed of all manufacturing costs, such as raw materials, depreciation, labor, etc.





## Income statement format and components

Net revenues from Sales of goods and services
– Cost of goods sold/Cost of service provided
Gross profit
– Other operating Expenses (SG&A)
**Operating income from continuing operations**

Operating components

+ Other Income and Revenues

Non operating components

**Recurring income before interest and taxes from continuing operations**
– Financing Costs
**Recurring (pretax) income from continuing operations**
+/ – Unusual or Infrequent Items
**Pretax income from Continuing Operations**
– Income Tax Expense
**Net Income from Continuing Operations**
+/ – Income from Discontinued Operations (net of tax)
+/ – Extraordinary Items (net of tax)
**Net Income**

The best indicator of future earnings





## Income statement: format

- **Unusual or infrequent items (nonrecurring items)**
  - Reported "above the line" and presented on a pretax basis.
    - ✓ G/L from the sale of assets or part of a business;
    - ✓ Impairments, write-offs, write-downs, and restructuring costs.
- **Extraordinary items (presented on net of tax)**
  - Loss from expropriation of assets;
  - Gains or losses from early retirement of debt;
  - Uninsured losses from natural disasters.

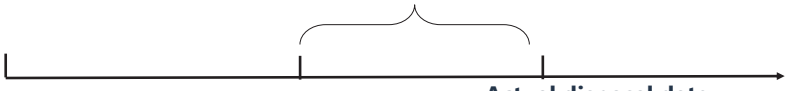
IFRS prohibit. US GAAP no longer include after Dec. 15, 2015.

- **Discontinued operations (presented on net of tax)**
  - When a company disposes of or establishes a plan to dispose of one of its component operations and will have no further involvement in the operation, the income statement reports separately the effect of this disposal as a "discontinued" operation under both IFRS and US GAAP.
- **Accounting changes (notes)**
  - Change in accounting principle (might be retrospective);
  - Change in accounting estimate (prospective and not a below line item);
  - Error (retrospective).

# Income statement: discontinued operations

Report discontinued operations (net of tax)

**Phase out period**



**Measurement date**

Restate past income statement to separate discontinued operations.

The date when the company plans to dispose an operation.

**Actual disposal date**

The date when the company will recognize any estimated loss in the phase out period and on the sale of the business.
Any expected gain should be reported after the sale is completed.





# Income statement format and components

- **Above the line**
  - Unusual or infrequent items (nonrecurring items)
    - ✓ Either unusual or infrequent but not both
    - ✓ Presented on a pretax basis
- **Below the line (presented on net of tax)**

| Extraordinary items | Discontinued operations | Accounting changes |
|---|---|---|
| •Both unusual and infrequent<br>•Examples:<br>•Losses from an expropriation assets<br>•Gains or losses from early retirement of debt;<br>•Uninsured losses from natural disasters. | •The time between Measurement date and Disposal date<br>→ phase out period | •Change in accounting principle<br>→retrospective application<br>•Change in accounting estimate<br>→prospective application (and not a below line item).<br>•Errors<br>→restate financial statement<br>→Notes disclosure |





# Revenue recognition

- **According to the International Accounting Standards Board (IFRS)**
  - **For products sold**
    - ✓ Revenue can be measured reliably;
    - ✓ Probable inflows of economic benefits;
    - ✓ Transfer significant risks and ownership of the goods;
    - ✓ No continuing management or effective control over goods sold;
    - ✓ Relevant costs incurred can be measured reliably.
  - **For services rendered**
    - ✓ Revenue can be measured reliably;
    - ✓ Probable inflows of economic benefits
    - ✓ Stage of completion can be measured reliably;
    - ✓ The costs incurred for the transaction and the costs to complete the transaction can be measured reliably.

## Revenue recognition

- **According to the Financial Accounting Standards Board (GAAP)** specify two criteria for recognition of revenue
  - Realized or realizable;
  - Earned.
- **Guidance from the Securities and Exchange Commission (SEC)**
  - The price is determined or determinable;
  - The seller is reasonably sure of collecting money.
  - The product has been delivered or the service has been rendered;
  - There is evidence of an arrangement between the buyer and seller;





## Revenue recognition: LT Contract

| | Condition | Methods | | Descriptions |
|---|---|---|---|---|
| **LT Contract** | ✓ Projects of long-term contract;<br>✓ **Reliable estimates** of the revenues, costs and completion time. | **GAAP** | **Percentage-of-completion method** | ✓ Revenue, expense, and profit recognized as work is performed;<br>✓ Percentage of completion measured by the total cost incurred to date divided by the total expected cost of the project. |
| | | **IFRS** | | |
| | ✓ Projects of long-term projects;<br>✓ Outcome of the project **cannot be reliably estimated.** | **GAAP** | **Completed contract method** | Revenue, expense and profit are recognized only when the contract is complete. |
| | | **IFRS** | ✓ Revenue is recognized to the extent of contract costs;<br>✓ Costs are expenses when incurred;<br>✓ Profits is recognized only at completion. | |





## Example: LT contract

- BBB Corp. signs a contract of building a vessel pricing at $10,000. The reliable expected cost of the contract is $5,000.
  Project costs incurred during the establishment are as follows:

| Year | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|
| **Cost incurred** | $3,500 | $1,000 | $500 | $5,000 |

- Calculate the net income of BBB each year under percentage-of-completion and completed contract methods.

## Example: LT contract

- **Correct Answer:**
  - **Percentage-of-completion**

| Year | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|
| Revenue | $7,000 | $2,000 | $1,000 | $10,000 |
| Expense | ($3,500) | ($1,000) | ($500) | $5,000 |
| Net income | $3,500 | $1,000 | $500 | $5,000 |

  - **Completed contract**

| Year | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|
| Revenue | — | — | $10,000 | $10,000 |
| Expense | — | — | $5,000 | $5,000 |
| Net income | — | — | $5,000 | $5,000 |





## Revenue recognition: LT contract

- **POC vs. Completed-contract: Impact on F/S during one fiscal year**

| F/S | Items | POC | Completed Contract |
|---|---|---|---|
| CFS | Cash flows | Same | Same |
| I/S | Income Volatility | Less | Reverse |
| | Net Income | Greater | |





## Revenue recognition: installment sales

| | | | | |
|---|---|---|---|---|
| **Installment contract** (a firm finances a sale and payments are expected to be received over an extended period) | **GAAP** | Collectability cannot be **reasonably estimated.** | **Installment sales method** (Similar to percentage of completion method) | ✓ Profit is recognized as cash is collected;<br>✓ Profit is equal to cash collected during the period multiplied by the total expected profit as a percentage of sales;<br>✓ Used in limited circumstances, e.g. sale of estate or other firm assets. |
| | | Collectability is **highly uncertain**. | **Cost recovery method** (Similar to the completed contract method) | ✓ Sales are recognized when cash is received;<br>✓ Profit is recognized only when cash collected exceeds costs incurred. |

## Revenue recognition: installment sales

| | | | |
|---|---|---|---|
| **Installment contract** (a firm finances a sale and payments are expected to be received over an extended period) | **IFRS** | Outcome **can** be reliably estimated | ✓ The discounted present value of the installment payments is recognized at the time of sale;<br>✓ The difference between the installment payments and the discounted present value is recognized as interest over time. |
| | | Outcome **cannot** be reliably estimated | ✓ Revenue recognition under IFRS is similar to cost recovery method. |





## Example: installment sales

- K property corporation sold a piece of land for $5,000, whose historical cost reported on financial statements was $3,000.

  The expected cash flows for the sale are as follows:

| Year | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|
| Cash collected | $3,500 | $1,000 | $500 | $5,000 |

- Compute K's profit under the installment and cost recovery methods.





## Example: installment sales

- **Correct Answer:**
  - **Installment method**

| Year | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|
| Revenue | $3,500 | $1,000 | $500 | $5,000 |
| Expense | ($2,100) | ($600) | ($300) | $3,000 |
| Net income | $1,400 | $400 | $,200 | $2,000 |

  - **Cost recovery method**

| Year | 2015 | 2016 | 2017 | Total |
|---|---|---|---|---|
| Revenue | $3,500 | $1,000 | $500 | $5,000 |
| Expense | ($3,000) | — | — | $3,000 |
| Net income | $500 | $1,000 | $500 | $2,000 |

## Gross and net reporting of revenue

- **Gross revenue reporting**
  - Gross amount of sales proceeds received from their customers.
- **Net revenue reporting**
  - Net difference between sales proceeds and their cost.
- **Under GAAP, to report gross revenue, the firm must:**
  - Be the primary obligor of the contract;
  - Independently choose its supplier;
  - Tolerate risks involved, including inventory risk and credit risk;
  - Free to determine the price.





## Earnings per share (EPS)

- **Earnings per share (EPS)**
  - EPS is usually used to measure profitability of listed firms. (No need for nonpublic firms to provide EPS).
  - Require the **presentation of EPS** on the face of
    - ✓ income statement for net profit or loss (net income);
    - ✓ profit or loss (income) from continuing operations.
  - EPS is reported only for shares of common stock (ordinary stock).
    - ✓ Basic EPS
    - ✓ Diluted EPS, diluted by
      - ◆Convertible debt;
      - ◆Convertible preferred stock;
      - ◆Stock option;
      - ◆Warrants.





## Basic EPS

- **Formula**

$$\text{Basic EPS} = \frac{\text{NI - Preferred dividends}}{\text{weighted average number of common shares outstanding}}$$

- **Weighted average number of common share outstanding**
  - New issue, repurchase is **weighted by time (days or months).**
  - Stock dividend and split
    - ✓ **Stock dividends**. Additional shares are distributed as a proportion of current holding shares.
      - ◆10% stock dividend: the holder of 100 shares of stock would receive 10 additional shares.
    - ✓ **Stock splits**. Divide current shares into a post-determined number of shares.
      - ◆2-for-1 split: 100 shares will be converted to 200 shares;
      - ◆3-for-2 split: 100 shares will be converted to 150 shares.
    - ✓ Stock dividends or split should be adjusted in a retroactive way.
      - ◆Cannot be weighted directly, instead number of outstanding stocks should be adjusted to the number before stock dividends or split when calculating EPS.

## Diluted EPS

$$\text{Diluted EPS} = \frac{\text{adjusted income available for common shares}}{\text{weighted avg. common \& potential common shares out}}$$

$$= \frac{\left[\text{NI} - \text{div}_{\text{preferred}}\right] + \left[\text{div}_{\substack{\text{convertible}\\\text{preferred}}}\right] + \left[\text{interest}_{\substack{\text{convertible}\\\text{debt}}}\right](1-t)}{\text{WACSO} + \left[\text{shares}_{\substack{\text{conversion of}\\\text{conv. pfd. shares}}}\right] + \left[\text{shares}_{\substack{\text{conversion of}\\\text{conv. debt}}}\right] + \left[\text{shares}_{\substack{\text{issuable from}\\\text{stock opt.}}}\right]}$$





## Comprehensive income

- **Retained earnings.** Cumulative amount of the company's profits that have been retained in the company. Hence transactions affecting net income will affect shareholders' equity through retained earnings.
- **Statement of comprehensive income**
  - Begin with profit or loss (NI) from the income statement;
  - Then **other comprehensive income (OCI)**.
    - ✓ Foreign currency translation adjustment on a foreign subsidiary;
    - ✓ Unrealized G/L on derivatives contracts accounted for as cash flow hedges;
    - ✓ Unrealized G/L on available for sale securities;
    - ✓ Certain costs of a company's defined benefit post-retirement plans that are not recognized in the current period;
    - ✓ (Solely for IFRS) changes in the value of long-lived assets measured using the revaluation model rather than the cost model.





# Reading 25

**Understanding the B/S**

## Alternative formats of B/S presentation

- **Classified balance sheet**
  - Under IFRS and U.S. GAAP, firms should distinguish between current and non current assets (liabilities).
  - With separately classified current and non-current assets and liabilities.
- **Liquidity-based presentations** (Under IFRS only)
  - Listed all assets and liabilities by liquidity;
  - Used when resulting in more relevant and reliable presentation.





## Balance sheet format and components

- **Stockholders' equity :**

| | |
|---|---|
| **Capital** | Common stock , preferred stock |
| **Additional paid-in-capital** | Capital in excess of par i.e. premium |
| **Treasury stock** | Stock repurchased by the issuing firm but not yet retired.<br>No voting rights, no dividend |
| **Retained earnings** | Net Income – Dividend |
| **Accumulated other comprehensive income** | 1. Foreign currency translation adjustment on a foreign subsidiary<br>2. Unrealized G/L on derivatives contracts accounted for as cash flow hedges<br>3. Unrealized G/L on available for sale securities<br>4. Certain costs of a company's defined benefit post-retirement plans that are not recognized in the current period |
| **Minority interest** | Group accounting |





## Financial instruments

| Category | Measurement | Unrealized/Realized Gains or Losses |
|---|---|---|
| **Held-to-maturity (HTM)** | Amortized cost | Unrealized: not reported<br>Realized: reported in income statement |
| **Trading** | Fair value | Unrealized: reported in income statement<br>Realized: reported in income statement |
| **Available-for-sale (AFS)** | Fair value | Unrealized: reported in equity<br>Realized: reported in income statement |

# Reading 26

## Understanding the C/F





## Types of cash flows

- **U.S. GAAP Cash Flow Classification**

| **Cash flows from Operating Activities**<br>Cash flows resulting from transaction that affect a **firm's net income** | |
|---|---|
| **Inflows** | **Outflows** |
| Cash collected from customers | Cash paid to employees and suppliers |
| Sale proceeds from trading securities | Acquisition of trading securities |
| Interest received | Interest paid |
| Dividend received | Taxes paid |
| | Cash paid for other expenses<br>Purchase trading |





## Types of cash flows

- **U.S. GAAP Cash Flow Classification**

| **Cash flows from Investing Activities**<br>Cash flows resulting from the acquisition or disposal of **long – term** assets and certain investments | |
|---|---|
| **Inflows** | **Outflows** |
| Sale proceeds from fixed assets | Acquisition of fixed assets |
| Sale proceeds from debt & equity investments | Acquisition of debt & equity investments |
| Principal received from loans made to others | Loans made to others |

# Types of cash flows

- **U.S. GAAP Cash Flow Classification**

| **Cash flows from Financing Activities**<br>Cash flows resulting from transaction that affect a firm's **capital structure** | |
|---|---|
| **Inflows** | **Outflows** |
| Principal amounts of debt issued | Principal paid on debt |
| Proceeds from issuing stocks | Payments to reacquire stock |
| | Dividends paid to shareholders |





# Types of cash flows

| Items | U.S. GAAP | IFRS |
|---|---|---|
| **Interest received** | CFO | CFO or CFI |
| **Interest paid** | CFO | CFO or CFF |
| **Dividends received** | CFO | CFO or CFI |
| **Dividends paid** | CFF | CFO or CFF |
| **Taxes paid** | CFO | CFO, CFI or CFF |
| **Bank overdrafts** | CFF | Cash equivalents |
| **Disclosure** | Encourage **direct method**, but allows indirect method. If direct method presented, footnotes must also be provided of the indirect method. | Encourage **direct method,** but permits either<br>IFRS permits more flexibility in reporting |

- **Direct method is encouraged**





# Cash flow statement: memorizing tips

- **A basic setting: To an entity**
  - Cash inflow: +
  - Cash outflow: -
- **Liability**
  - + Δ; Namely, + (ending – beginning)
- **Assets**
  - - Δ ; Namely, - (ending – beginning)

## CFO calculation: indirect method

| Calculation of CFO by Indirect method | |
|---|---|
| **Net income** | |
| **+ Non-cash expenses or losses** | Income statement items |
| **- Non-cash revenues or gains** | |
| **+/- Non-operating items** | |
| **-Increase in non-cash operating asset accounts (Inventory, A/R)** | Balance sheet items (working capital) |
| **+Increase in operating liability accounts (A/P)** | |
| =CFO | |





## CFO calculation: direct method

| Calculation of CFO by Direct method | |
|---|---|
| **Cash received from customers** | Opening A/R + net sales – Closing A/R=Net sales-ΔA/R |
| **- Cash paid to suppliers** | Opening A/P + COGS – Closing A/P<br>= - COGS +ΔA/P + Depreciation included in COGS -ΔInventories<br>(COGS = Opening Inventory + purchase – Closing Inventory) |
| **- Cash paid to employees** | Opening wage pay' + wage exp. – Closing wage pay'<br>=-wage expense + Δ wage payables |
| **- Interests paid** | Opening interest payables + interest expense – Closing interest payables=- interest expense +Δ Interest payables |
| **- Tax paid** | Opening tax payables + income tax expense – Closing tax payables = - income tax expense +Δ tax payables+ΔDTL-ΔDTA |
| **= CFO** | |





## Cash flow statement: calculation

| | | |
|---|---|---|
| Cash collection | = net sales | -ΔA/R + Δunearned revenue |
| Cash inputs | =-COGS | -Δinventories + ΔA/P+ Dep |
| Cash expenses | =-operating expenses | +ΔO/P + Δaccruals |
| Cash interest | =-interest expenses | + ΔI/P+ payable+(-) Amortization of bond discount(premium) |
| Cash taxes | = —income tax expenses | + ΔT/P + ΔDTL-ΔDTA |

Net income
+ Depreciation
+Loss/-Gain not relating to operating activities

- Δ working capital (excluding cash, loan, dividend payables and N/P)

**Note:Δhere means increase.**

➢ **Calculation of CFO — Direct method**

## CFI calculation

- **Cash used in purchase of fixed assets:**
  - Pay attention to the movement of fixed assets.
  - Book Value = Carrying value = Purchase cost – AD – Impairment
  - BV end = BV Begin + Purchase – Disposal BV – Depreciation
- **Proceeds received from sale of fixed assets**
  - Gain or loss = proceeds received – disposal NBV
    - ✓ Gain or loss resulting from disposal of PP&E or other long term assets are NOT presented in the CFI;
    - ✓ instead, cash generated should be calculated based on the gain or loss.
- **Review other non-current assets: an increase in these items using cash, and vice versa.**





## CFF calculations

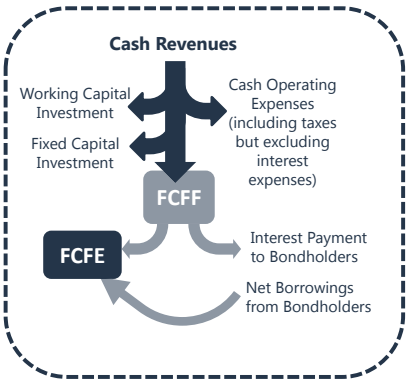
- **All events that could have increased or decreased cash must be reconstructed.**
- **Review long-term debt and stock**
  - Increases supply cash and decreases use cash.
- **Dividend paid**
  - Dividend paid = - Dividend declared + Δdividend payables
  - Opening R/E + Net Income – Dividend declared = Ending R/E





## Free cash flow

- Free cash flow **attempts to measure the cash available for discretionary purposes.**
- **Two common measure:**
  - **Free cash flow to the firm (FCFF)**
    - ✓ Cash available to all investors, both equity owners and debt holders
  - **Free cash flow to equity (FCFE)**
    - ✓ Cash available to equity owners



## Free cash flow

- **Free cash flow to the firm (FCFF)**
  - **From EBIT**: FCFF = EBIT*(1-tax rate) + NCC – FCInv – WCInv
  - **From NI**: FCFF = NI + NCC + [ Int * (1 - tax rate) ] – FCInv – WCInv
  - **From CFO:** FCFF = CFO + [ Int * (1 - tax rate) ] – FCInv
- **Free cash flow to equity (FCFE)**
  - **From FCFF:** FCFE=FCFF-Int ( 1-t ) +Net borrowing
  - **From CFO:** FCFE = CFO – FCInv + Net borrowing
    - ✓ Where:
      - ◆ NI = net income
      - ◆ NCC = noncash charges ( depreciation and amortization)
      - ◆ Int = interest expense
      - ◆ FCInv = fixed capital investment (net capital expenditure)
      - ◆ WCInv = working capital investment
      - ◆ Net borrowing = debt issued – debt repaid





## Example

- An analyst is planning to make a valuation on a privately held company by using a FCF Model. In order to determine the free cash flow to all capital suppliers, he collected the following data (in million):

| | |
|---|---|
| Operating cash flow | 600 |
| Interest paid | 40 |
| Investment in working capital | 80 |
| Investment in fixed asset | 50 |
| Tax rate | 40% |

The free cash flow the analyst is planning to determine is *closest* to:

A. 540.
B. 654.
C. 574.

- **Correct answer: C.**
  - Free cash flow = CFO + interest paid (1 - tax rate) – investment in fixed asset = 600 + 40* ( 1-0.4 ) – 50 = 574.





# Reading 27

**Financial Analysis Techniques**

# Ratio and ratio analysis

- **Categories of ratios**
  - **Profitability** ratio – ability to generate profit from sales.
  - **Activity** ratio – efficiency in using assets to generate revenue
  - **Liquidity** ratio – ability to pay short – term debt
  - **Solvency** ratio – ability to pay long – tem debt
  - **Valuation** ratio – analysis for investment in common equity





# Profitability ratios

- **Profit/Net revenue**

Gross profit margin = Gross profits/net revenue
Operating profit margin = EBIT/net revenue
Pretax margin = EBT/net revenue
Net profit margin = NI/net revenue

- **Profit/Capital**

Return on assets (ROA) = [NI + int.(1-t)] / average total assets
Operating return on assets = EBIT / average total assets
[Return on total capital (ROTC) = EBIT / average total capital]
Return on equity (ROE) = NI / average total equity
Return on common equity = (NI- Preferred Dividend) / average common equity





# Activity ratios

- **A firm's efficiency in using assets to generate revenue**
  - Turnover = Net revenue/ assets

Total asset turnover = net revenue/ average total assets
Fixed asset turnover = net revenue / average net fixed assets
Working capital turnover = net revenue / average **WC**
**Where:**
Working capital = current assets – current liabilities

## Activity ratios

| Inventory | A/R | A/P |
|---|---|---|
| Inventory turnover = COGS / average inventory | Receivables turnover = Net revenue / average A/R | Payables turnover = Purchase / average A/P |
| Average inventory processing period = 365 / inventory turnover | Average receivables collection period = 365 / receivables turnover | Average payment period = 365 / payables turnover |
| Operating cycle = collection period + inventory period | | |
| Cash conversion cycle = collection period + inventory period - payment period | | |

Corporate finance





## Liquidity ratios

- **A firm's ability to pay short – term debt**

**Current ratio** = Current assets / Current liabilities

**Quick ratio**

= [cash + marketable securities + receivable] / Current liabilities

= [current asset - inventories] / Current liabilities

**Cash ratio**

= [cash + marketable securities] / Current liabilities

**Defensive interval**

= (cash + marketable securities + receivables) / average daily expenditures





## Solvency ratios

- **A firm's ability to pay long – term debt**
- **Leverage**

Debt-to-equity ratio = D / E

Debt-to-capital= D/(D+ E)

Debt-to-assets = D / A

**Financial leverage = A / E**

- **Coverage**

Interest coverage = EBIT / Interest

Fixed charge coverage

= (EBIT + lease payments) / (Interest + lease payments)

## Valuation ratios

| | Numerator | Denominator |
|---|---|---|
| **P / E** | Price per share | Earnings Per share |
| **P / CF** | | Cash flow per share |
| **P / S** | | Sales per share |
| **P / BV** | | Book Value per share |

| | Numerator | Denominator |
|---|---|---|
| **BEPS & DEPS** | | |
| **Cash flow per share** | Cash flow from operations | Weighted average number of ordinary shares outstanding |
| **EBITDA per share** | EBITDA | |
| **Dividends per share** | Common dividends declared | |





## Sustainable growth rate

- **Clean surplus relationship:** Assume changes in equity only relate to changes in retained earnings
  - No changes in capital and OCI

$$g = ROE \times RR = ROE \times \left(1 - \frac{\text{div declared}}{\text{Net Income}}\right)$$

| | Company A | Company B |
|---|---|---|
| **EPS** | 3 | 4 |
| **DPS** | 1.5 | 1 |
| **ROE** | 14% | 12% |

**14% * 50% = 7%**

**12% * 75% = 9%**





## DuPont system of analysis

- **The three-part approach**

$$ROE = \left(\frac{\text{net income}}{\text{sales}}\right)\left(\frac{\text{sales}}{\text{assets}}\right)\left(\frac{\text{assets}}{\text{equity}}\right)$$

$$= \begin{pmatrix}\text{net profit}\\ \text{margin}\end{pmatrix}\begin{pmatrix}\text{asset}\\ \text{trunover}\end{pmatrix}\begin{pmatrix}\text{leverage}\\ \text{ratio}\end{pmatrix}$$

✓ It is not for the purpose of computing ROE, but for the purpose of decomposing the known ROE.

## DuPont system of analysis

- **The five-part analysis**

$$ROE = \left(\frac{\text{net income}}{\text{EBT}}\right)\left(\frac{\text{EBT}}{\text{EBIT}}\right)\left(\frac{\text{EBIT}}{\text{revenue}}\right)\left(\frac{\text{revenue}}{\text{assets}}\right)\left(\frac{\text{assets}}{\text{equity}}\right)$$

$$= \begin{pmatrix}\text{tax}\\ \text{burden}\end{pmatrix}\begin{pmatrix}\text{interest}\\ \text{burden}\end{pmatrix}\begin{pmatrix}\text{EBIT}\\ \text{margin}\end{pmatrix}\begin{pmatrix}\text{asset}\\ \text{trunover}\end{pmatrix}\begin{pmatrix}\text{leverage}\\ \text{ratio}\end{pmatrix}$$

✓ Tax burden = 1 – tax rate
✓ Interest burden = 1 – interest rate





## Analysis of CFO

| Other cash flow ratios | |
|---|---|
| **Performance ratios** | **Coverage ratio** |
| CFO/ Revenue | CFO / Total debt |
| CFO/ Average total assets | CFO / Cash paid for long–term assets |
| CFO / Average total equity | CFO / Cash long–term debt repayment |
| CFO/ Operating income | CFO/ dividend paid |
| (CFO – Preferred dividends) / Weighted average number of common shares | CFO / Cash outflows from investing and financing activities |
| | (CFO + interest paid + taxes paid)/ Interest paid |





# Reading 28

**Inventories**

# Framework

1. Inventory accounting/ The cost flow method
   - Specific identification
   - Last in first out (LIFO)
   - First in first out (FIFO)
   - Weighted average (AVCO)
2. Periodic vs. Perpetual Inventory systems*
3. Inventory valuation
   - U.S. GAAP
   - IFRS
4. LIFO reserve and LIFO liquidation
5. Inventory adjustment
6. Inventory management
7. Inventory disclosure *





## Inventory accounting

- **Product costs.** cost composed the value of inventory.
  - Capitalized in inventories, including
    - ✓ Purchase cost - trade discounts and rebates;
    - ✓ Conversion costs (e.g. labor and overhead);
    - ✓ Other costs required to make inventory in use.
  - Capitalizing cost as an asset (inventory) delays the expense till the sale of inventory and the recognition of revenues.
- **Period costs.**
  - Expensed during the period, including
    - ✓ Abnormal waste of materials, labor, or overhead;
    - ✓ Storage costs (unless required as part of production);
    - ✓ Administrative and selling expenses.





## Inventory valuation method

- **In periods of rising prices and stable /increasing inventory quantities**

| | | LIFO | FIFO |
|---|---|---|---|
| **I/S** | | Higher COGS | Lower COGS |
| | | Lower EBIT | Higher EBIT |
| | | Lower taxes | Higher taxes |
| | | Lower net income(EAT) | Higher net income (EAT) |
| **B/S** | | Lower inventory balances | Higher inventory balances |
| | | Lower working capital | Higher working capital |
| **CFS** | | Higher CFO(↓ taxes paid ) | Lower CFO(↑ taxes paid ) |
| **Ratios** | **Profitability** | Lower net/gross margins | Higher net/gross margins |
| | **Liquidity** | Lower current ratio | Higher current ratio |
| | **Solvency** | Higher D/A and D/E | Lower D/A and D/E |
| | **Activity** | Higher inventory turnover | Lower inventory turnover |

## Periodic vs. perpetual inventory systems*

| Periodic | Perpetual |
|---|---|
| • "Purchase" account;<br>• Balances of inventory and COGS are reported at the end of accounting period. | • Balances of inventory and COGS are reported continuously. |
| •Same result for FIFO & Specific identification method<br>•Different result for LIFO & AVCO | |





## Inventory valuation

| U.S. GAAP | IFRS |
|---|---|
| The lower of | The lower of |
| • Cost<br>Or<br>• Market<br>  • If replacement cost (RC) > NRV<br>  Market = NRV<br>  • If replacement cost (RC) < NRV – normal profit margin<br>  Market = NRV – normal profit margin<br>  • NRV – normal profit margin < RC < NRV<br>  Market = replacement cost | • Cost<br>Or<br>• Net realizable value<br>  NRV = selling price – estimated cost of completion – selling costs |
| If Cost > Market<br>• Written down to market (B/S)<br>• Loss on the I/S<br>• **No written up** is allowed | If Cost > NRV<br>• Written down to NRV (B/S)<br>• Loss on the I/S<br>• **Can be written up**<br>• Gain on the I/S |





## LIFO to FIFO conversion

- **LIFO reserve**
  - The difference between the reported LIFO inventory carrying amount and the inventory amount that would have been reported if the FIFO method had been used.
  - LIFO reserve = FIFO inventory – LIFO inventory
- **LIFO to FIFO Conversion**
  - $INV_F = INV_L$ + LIFO reserve
  - $COGS_F = COGS_L$ - △ LIFO reserve
  - B/S:
    - ✓ Asset: $+LIFO_{Reserve}$ ,
    - ✓ +Equity: (retained earnings) $LIFO_{Reserve}^{0} \times(1-t_{past})+ \Delta LIFO_{Reserve} \times(1-t_{current})$
    - ✓ - Reduction in cash: $- LIFO_{Reserve}^{0} \times t_{past} - \Delta LIFO_{Reserve} \times t_{current}$
  - I/S: $+NI + \Delta LIFO_{Reserve} \times(1-t_{current})$
    - ✓ $\Delta LIFO_{Reserve} = LIFO_{Reserve}^{1} - LIFO_{Reserve}^{0}$

## LIFO liquidation

- **LIFO liquidation**
  - A LIFO liquidation incurs when purchased volume is less sales volume.
    Or, the decrease in volume or quantity of inventory
  - In this case, the prices for goods being sold are no longer recent prices.
- **Under LIFO liquidation, and if price is rising**
  - COGS does not reflect current costs;
  - LIFO reserve may decline;
  - An analyst should adjust COGS for decrease in LIFO reserve.





## Example

- The following information is available about a manufacturing company.

| | $ million |
|---|---|
| Cost of ending inventory computed using FIFO | 4.3 |
| Net realizable value | 4.0 |
| Current replacement cost | 3.9 |

Compared to U.S. GAAP, the company's gross profit ($ millions) computed under International Financial Reporting Standards (IFRS) is *most likely*:

A. The same.
B. 0.1 lower.
C. 0.1 higher.

- **Correct answer: C**





# Reading 29

**Long-Lived Assets**

## Capitalize or expense

- **How to treat an expenditure depending on the nature of the expenditure**
  - Capitalize as an asset on the **B/S**;

  or
  - Recognize as an expenses in the **I/S**;
- **Remember: The asset** you capitalized today **will be** expensed in the future.

Impact on the Cash flow statement:

- **Capitalized expenditures** are classified as **CFI**
- **Expensed expenditures** are classified as **CFO**





## Capitalize or expense

| F/S | Items | Capitalizing | Expensing |
|---|---|---|---|
| B/S & ratios | Total assets | Higher | Reverse |
| | Shareholders' equity | Higher | |
| | Leverage ratios (debt/equity & debt/assets) | Lower | |
| I/S & ratios | Income volatility | Lower | |
| | Net income – first year ( ROA & ROE ) | Higher | |
| | Net income – later years ( ROA & ROE ) | Lower | |
| CFS | **Total cash flow** | **Same** | **Same** |
| | Cash flow from operating | Higher | Reverse |
| | Cash flow from investing | Lower | |





## Capitalizing interest

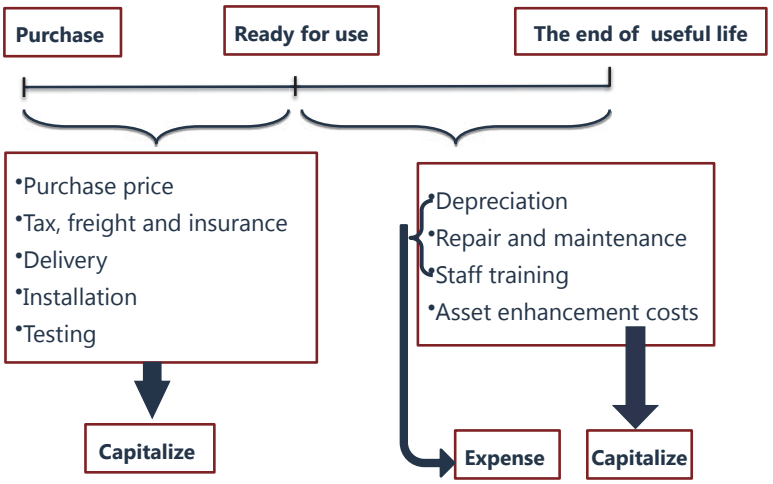
- **Under U.S.GAAP and IFRS**
  - When a firm constructs an asset for its own use or resale, the interest that accrues during the construction period must be capitalized as a part of the asset's cost (depreciation or COGS; IFRS: net interest expense, US GAAP no reduction)

| Items / Impacts | Int exp | Income statement impacts | Net Income | Interest coverage ratio | CFI | CFO |
|---|---|---|---|---|---|---|
| First Year | N/A | No | Higher | Higher? the same? | Understate | Overstate |
| Later Years | | Depreciation expense | Lower | Lower | | |

  - Implications for analysis
    - ✓ Treat as normal interest
    - ✓ i.e. interest expense charged to I/S directly, and classified as part of CFO

## Tangible assets*

**Capitalize or expense**








## Tangible assets*

| | Measurement | |
|---|---|---|
| | **Historical costs** | **Carrying value** |
| Also called: | • The gross investment in the assets | • The carrying amount<br>• The net book value<br>• The book value<br>• The ending net investment in assets |
| Measurement | Initial measurement<br>• **Purchase price**<br>• **Tax, freight and insurance**<br>• **Delivery**<br>• **Installation**<br>• **Testing** | Subsequent measurement<br>Equals to<br>Historical costs → Cost model<br>– accumulated depreciation<br>– accumulated impairment losses<br>or<br>Revaluation (IFRS only) → Revaluation model |





## Depreciation

| **Depreciation** | |
|---|---|
| **Straight-Line** | SL depreciation expense $= \frac{\text{cost} - \text{residual value}}{\text{useful life}}$ |
| **Accelerated Depreciation** | Depreciation expense=<br>(2/asset life in years) ×net book value at the beginning of year X |
| **Units – of – production** | $\frac{\text{Orignalcost-salvage value}}{\text{Life in output units}} \times \text{Out put units in period}$ |

## Depreciation

| | Straight line | Accelerated (DDB) |
|---|---|---|
| **Depreciation expense** | **Lower** | **Reverse** |
| **Net income** | **Higher** | |
| **Assets** | **Higher** | |
| **Equity** | **Higher** | |
| **ROA** | **Higher** | |
| **ROE** | **Higher** | |
| Total asset turnover ratios | Lower | Higher |
| Cash flow – Tax | Same | Same |





## Intangible Assets

➢ **Long – term assets without physical substance**

| Identifiable IA | Unidentifiable IA | Internally generated |
|---|---|---|
| • **Can be purchased separately**<br>• **e.g. Patents, Trademarks, Copyright purchased externally**<br>• **Some have** a finite useful life and **others have** an indefinite useful life | • **Cannot be purchased separately and may have** an indefinite life<br>• **e.g. Goodwill** | • Cannot be capitalized **on B/S**<br>• **e.g. Research and Development cost under U.S. GAAP** |
| **Capitalized** on the B/S | | •**Expensed** as incurred |

IA with a finite UL – Amortization over UL (SL, Zero salvage value)
IA with an indefinite UL - Annual impairment test





## Intangible assets

| Type of Expenditure | IFRS | U.S.GAAP |
|---|---|---|
| **Research** | **Expense as incurred** | |
| **Development** | **Capitalize if certain criteria are met** | Expense as incurred<br>Except for :<br>·Costs to develop a **software**<br>• **For sales to others**<br>✓ Expensed as incurred.<br>✓ Once economic feasibility is established, subsequent production costs can be capitalized.<br>• **For own internal use**<br>✓ Expense until it is probable that the project will be completed and that the software will be used as intended. Thereafter, Capitalized |

## Impairment of assets

| Tangible assets | Intangible assets |
|---|---|
| •Held for use<br>**Impairment indicators**<br>↓<br>**Impairment test** | •Held for use<br>**Goodwill**<br>**&**<br>**Other IA with indefinite useful life**<br>↓<br>**Annual impairment test** |
| •Held for sale<br>No depreciation<br>Immediate impairment test<br>If **Carrying value > NRV** | •Held for sale<br>No amortization<br>Immediate impairment test<br>If **Carrying value > NRV** |





## Impairment of assets – IFRS*

$$\begin{pmatrix}\text{carrying}\\ \text{value}\\ \text{of assets}\end{pmatrix} > \begin{pmatrix}\text{Recoverable}\\ \text{amount}\end{pmatrix}$$

↓

| The **higher** of | |
|---|---|
| Fair value less cost to sell | Value in use<br>**i.e. the present value of its future cash flow from continued use** |





## Impairment of assets – U.S. GAAP

- **Step1 Recoverability test / Impairment test**

$$\begin{pmatrix}\text{carrying}\\ \text{value}\\ \text{of assets}\end{pmatrix} > \begin{pmatrix}\text{undiscounted}\\ \text{future cash flows}\\ \text{generated by}\\ \text{the assets}\end{pmatrix}$$

- **Step2 Loss measurement**

$$\begin{pmatrix}\text{carrying}\\ \text{value}\\ \text{of assets}\end{pmatrix} - \begin{pmatrix}\text{fair market value}\\ \text{or}\\ \text{PV of future CF}\end{pmatrix}$$

## Impairment of assets

- **Once an asset is written down**
  - Under U.S.GAAP
    - ✓ Held for use → recoveries are not allowed
    - ✓ Held for sale → recoveries are allowed
  - Under IFRS, recoveries are allowed except for goodwill





## Impairment of assets

| Impairment Effects | |
|---|---|
| **Cash flow** | **No effect** |
| Assets | Decrease |
| Equity | Decrease |
| Debt/equity ratio | Increase |
| Current net income, ROA,ROE | Decrease |
| Future depreciation expense | Decrease |
| Future net income, ROA,ROE | Increase |
| Future asset turnover ratios | Increase |





## Revaluation of assets

| U.S. GAAP | IFRS |
|---|---|
| Cost model | Cost model & Revaluation model |

→ Permit upward revaluation of assets

- **Upward revaluation of assets will**
  - Increase assets and equity, leading to decrease leverage ratios (D/E);
  - Increase comprehensive income in the period the revaluation occurs.
  - In subsequent periods
    - ✓ Higher depreciation expense;
    - ✓ Lower net income, resulting in
      - ◆Lower ROA (return on asset);
      - ◆Lower ROE (return on equity).

## Investment property

- **The cost model**
  - The cost model is identical to the cost model used for property, plant, and equipment.
- **The fair value model**
  - The fair value model differs from the revaluation model used for property, plant, and equipment.
    - ✓ Under the revaluation model, whether an asset revaluation affects net income depends on whether the revaluation initially increases or decreases the carrying amount of the asset. (surplus in owner's equity);
    - ✓ Under investment property, all changes in the fair value of the asset affect net income (gain on income statement).





## Example

- An Australian shipping company which prepares its financial statements according to IFRS has experienced a decline in the demand for its products.

| | C$ |
|---|---|
| Carrying value of equipment (net book value) | 600,000 |
| Undiscounted expected future cash flows | 650,000 |
| Present value of expected future cash flows | 550,000 |
| Fair Value | 580,000 |
| Costs to sell | 60,000 |
| Value in use | 540,000 |

The impairment loss (in C$) is *closest* to:

A. 0.
B. 60,000.
C. 70,000.

- **Correct answer: B.**





# Reading 30

**Income Taxes**

## Tax return terminology

- **Taxable income:** the portion of its income that is subject to income taxes under the tax laws of its jurisdiction;
- **Taxes payable:** (current tax expense ) the tax liability on the balance sheet caused by taxable income;
- **Income tax paid:** the real cash payments for taxes also involves payments or refunds from other years;
- **Tax loss carry forward:** a taxable loss in the current period that may be used to reduce future taxable income;
- **Tax base:** the amount at which an asset or liability is valued for tax purpose.





## Financial reporting terminology

- **Accounting profit** (income before taxes or pretax income): income as reported on the income statement, in accordance with prevailing accounting standards, before the provisions for income tax expense.
  - **income tax expense = taxes payable + △ DTL - △DTA.**
- **Deferred tax liabilities**: temporary timing differences between a company's income as reported for tax purposes (taxable income) and income as reported for financial statement purposes (reported income).
- **Deferred tax assets:** deferred tax assets may result when the actual income tax payable based on income for tax purposes in a period exceeds the amount of income tax expense based on the reported financial statement income due to temporary timing differences.
- **Valuation allowance:** contra account to record the reduction of deferred tax assets, if the assets cannot be realized.
- **Carrying value:** the net amount shown for an asset or liability on the balance sheet; book value may also refer to the company's excess of total assets over total liabilities. For a bond, the purchase price plus (or minus) the amortized amount of the discount (or premium).





## Terminology

- **Timing difference**
  - **Temporary difference**
    - ✓ Difference will reverse

| Deferred tax assets | Deferred tax liabilities |
|---|---|
| B/S amounts that result from an excess of tax payable over income tax expense that are expected to be recovered from future operations. | B/S amounts that result from an excess of income tax expense over taxes payable that are expected to result in future cash outflows. |
| $\begin{pmatrix}\text{taxes}\\ \text{payable}\end{pmatrix} > \begin{pmatrix}\text{income tax}\\ \text{expense}\end{pmatrix}$ | $\begin{pmatrix}\text{taxes}\\ \text{payable}\end{pmatrix} < \begin{pmatrix}\text{income tax}\\ \text{expense}\end{pmatrix}$ |

  - **Permanent difference**
    - ✓ Difference will not reverse, thus **no deferred tax** issues

## Accounting base & tax base: assets

- An asset's tax base is the amount that will be deducted (expensed) on the tax return in the future as the economic benefits of the asset are realized.
- **Depreciable NCA**
  - Accounting base → Original cost – accumulated accounting depreciation
  - Tax base → Original cost – accumulated tax depreciation
- **R&D**
  - Accounting base (Expensed as incurred) → Zero
  - Tax base (Capitalized)→ Original cost - accumulated amortization
- **A/R**
  - Accounting base → Invoiced amount – allowance for bad debt
  - Tax base → Invoiced amount (do not recognize allowance)
- **Financial assets (for Trading and AFS financial assets held at Fair value)**
  - Accounting base → Fair value
  - Tax base →Amortized cost





## Accounting base & tax base: liabilities

- **Customer advance**
  - Accounting base (accrual accounting)→ Unearned revenue treat as a Liability
  - Tax base (cash accounting) →Revenue is recognized no liability arise → Zero
- **Warranty liability**
  - Accounting base (accrual accounting) →A liability is recognized for future obligation
  - Tax base (cash accounting) → Recognize a expense when a cash outflow incurred → Zero
- **Financial liabilities – Note payable (for Trading and AFS financial liability held at Fair value)**
  - Accounting base → Fair value
  - Tax base →Amortized cost

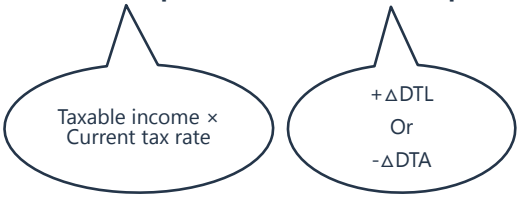




## Measurement

- **Income tax expense**

  **= Current tax expense +/- Deferred tax expense / income**




  - The **ending balance of DTL or DTA** is calculated at the end of each fiscal year, the net △ amount during current fiscal year.
    - ✓ **Tax rate applicable to the periods in which the DTA and DTL will be reversed** (forecast;
    - ✓ Usually the current tax rate.

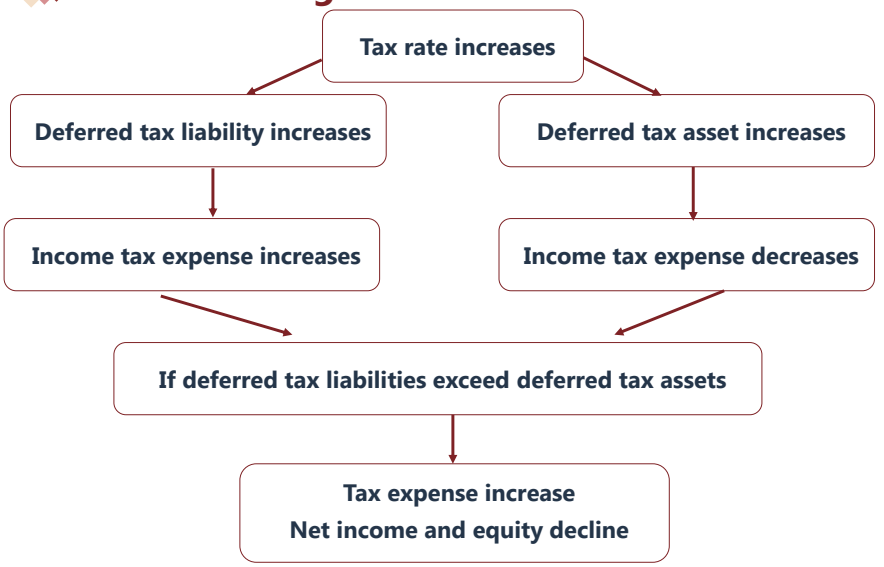
## Tax rate changes

- **If tax rate changes**
  - New DTA or DTL = $\text{Old DTA or DTL} \times \frac{\text{new tax rate}}{\text{old tax rate}}$
- **A change in accounting estimate**
  - The change in DTA and DTL due to the tax rate changes will be part of the current year △DTA and △DTL, and will impact the income tax expense for the year the changes take place.





## Tax rate changes








## Reversal of temporary difference

- **Treatment of DTL**
  - If unlikely to be reversed;
    - ✓ Treated as equity
  - If to be reversed;
    - ✓ Treated as true liability
  - If non-reversal/ reversal is uncertain;
    - ✓ Ignored
- **Treatment of DTA**
  - If <50% probability to be reversed
    - ✓ Valuation allowance is created

$$\text{DTA} = \text{DTA} - \begin{pmatrix}\text{Valuation}\\ \text{Allowance}\end{pmatrix}$$

$$\text{Asset} \downarrow \ \& \ \text{Income} \downarrow$$

# Reading 31

## Long-Term Liabilities and Leases





## Bond terminology

- **Bond Terminology**
  - The **balance sheet liability** of a bond is equal to the present value of its remaining cash flows (coupon payments and face value), discounted at the market rate of interest at issuance.
    - ✓ At maturity, the liability will equal the face value of the bond.
  - The **interest expense** (also known as the book value or carrying value of the bond) reported in the income statement is calculated by multiplying the book value of the bond liability at the beginning of the period by the market rate of interest of the bond when it was issued.
  - At the date of issuance, the market rate of interest may be equal to, less than, or greater than the coupon rate.
    - ✓ When the market rate is equal to the coupon rate, the bond is a **par bond** (priced at face value).
    - ✓ When the market rate is greater than the coupon rate, the bond is a **discount bond** (priced below par).
    - ✓ When the market rate is less than the coupon rate, the bond is a **premium bond** (priced above par).





## Example

- **On 31 Dec 2002, a company issued a three – year 10% annual coupon bond with a face value of $1000**
  - Market interest rate at issuance is 10%
  - Market interest rate at issuance is 8%
  - Market interest rate at issuance is 12%
- **What is the effect on B/S, I/S, CFS?**

## Example

- **CFS:** CFO Cash outflow = Coupon payment → $100 p.a.
  - ✓ For analysis purpose, the interest expense and the amortization of the premium should be separated
    - ◆e.g. Year 2003

| Cash outflow | Original CFO | | CFO for F/A | | CFF for F/A |
|---|---|---|---|---|---|
| | 100 | = | 84.12 | + | 15.88 |

  - ✓ Without adjustment
    - ◆CFO is understated and CFF is overstated





## Example

- **CFS:** CFO Cash outflow
  = Coupon payment → $100 p.a.
  - ✓ For analysis purpose, the interest expense and the amortization of the discount should be separated
    - ◆Year 2003

| Cash outflow/ inflow | Original CFO | | CFO for F/A | | CFF for F/A |
|---|---|---|---|---|---|
| | 100 | = | 114.24 | - | 14.24 |

  - ✓ Without adjustment
    - ◆CFO is overstated and CFF is understated

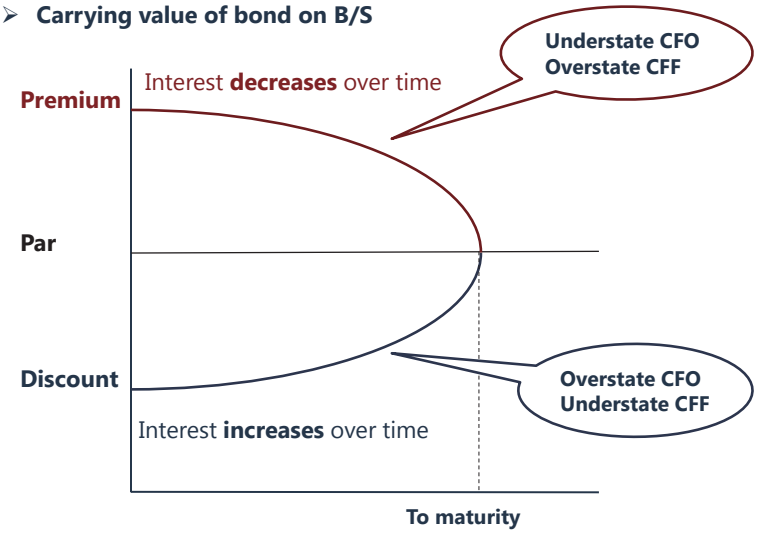
Cash inflow





## Summary

➢ **Carrying value of bond on B/S**



## Summary

- **Premium or discount bond**
  - **B/S** $\text{liability}_0 = \text{amount received}$

$$\text{liability}_t = \sum \frac{CF_t}{(1+MR_{issue})^t}$$

    - ✓ The amount of premium and discount is amortized over the time.
  - **I/S**
    - ✓ Premium (CR> Market rate) → Decrease over time

$$\text{Int. expn}_t = \text{coupon-prem. amortization}_t$$

    - ✓ Discount (CR < Market rate) → Increase over time

$$\text{Int. expn}_t = \text{coupon+disc. amortization}_t$$

  - **CFS** : No change for accounting /Adjust for F/A purpose





## Framework for lease

- **Classification of leases under U.S. GAAP & IFRS***
- **Accounting for Lease**
  - Lessee
  - Lessor
- **Operating lease ***
- **Off-balance sheet financing**





## Classification of leases

- A **lease** is a contractual arrangement where by the **lessor**, the owner of the asset, allows the **lessee** to use the asset for a specified period of time (lease term) in return for periodic lease payment.
  - Two partied involved in leases
    - ✓ Lessee： Use the asset
    - ✓ Lessor： Owner of the asset
- **Two types of leases (Classification)**
  - Operating lease
  - Finance lease/Capital lease (U.S.)

## Classification of leases – IFRS*

| Finance lease | Operating lease |
|---|---|
| **Transfers** from lessor to **lessee substantially all the risks and rewards incidental to ownership** of an asset. No specific condition for finance lease, but use finance lease when meeting one of the following conditions:<br>① Title transfer<br>② Bargain purchase option<br>③ The lease term is for the major part of the economic life of the asset<br>④ At the inception of the lease the present value of the minimum lease payments amounts to at least substantially all of the fair value of the leased asset<br>⑤ A specialized nature | **A lease** other than a finance lease. |







## Classification of leases – U.S.GAAP*

| Finance lease | Operating lease |
|---|---|
| **A lease transaction can be classified as a** Finance lease **by** lessee if meet at least one of the following criteria:<br>① The title to the leased asset is transferred to the lessee at the end of the lease period.<br>② A bargain purchase option exists.<br>③ The lease period is at least 75% of the asset's economic life.<br>④ The present value of the lease payments is equal to or greater than 90% of the fair value of the leased asset. | **A lease** not meeting any of those criteria is classified as an Operating lease |







1612 (1) 1606 (2)
1512 (2) 1506 (1) 1706 (1)

## Accounting for lease: lessee

| | Finance Lease | Operating Lease |
|---|---|---|
| B/S-**inception** | Leased asset = Lease liability =<br>PV of Minimal lease payment (MLP)<br>•MLP = Future lease payment over lease term | No effect |
| B/S-**periodic payment** | **Leased asset**<br>→ Depreciation over lease term<br>**Lease liability**<br>→ interest expense & principal repayment | |
| I/S-**periodic payment** | An interest expense is separated from the lease payment and recognized in the income statement. | Lease payment is recognized as a rental expense in I/S |
| Cash Flow | Principal repayment – **CFF**<br>Interest expense - **CFO** | **CFO** |

## Example

- GF leases a machine for its own use for 4 years with annual payments of 1000 paid in arrears ; The appropriate interest rate on the lease is 10%.
  - Calculate the impact of the lease on GF' balance sheet and income statement for each of the 4 years, including the immediate impact.
  - Assuming GF depreciates all assets on SL basis.





## Example

- **B/S is affected by Finance lease only**
- **At the inception of the lease**
  - Leased asset = lease liability =3169.8654=3170
  - N=4, I/Y=10, PMT=1000, FV=0, CPT PV -3168.8654=-3170
- **Over the lease term**
  - Leased asset → annual depreciation (SL) i.e. 3170 / 4years =792.5 p.a.
  - Lease liability → separate Interest expense & Lease payment





## Accounting of finance lease for lessee

T=0

B/S

| Asset leased 3170 | Lease obligation |
|---|---|
| | Current 683 |
| | Long-term 2487 |

T=1

B/S

| Asset leased 3170 | Lease obligation |
|---|---|
| | Current 683 |
| | Long-term 2487 |
| A.D. -792.50 | |
| Cash -1000 | Amortization -683 |

I/S

Dep. Exp. -792.50

Interest Exp. -317

Interest Exp.=$BV_0$ × interest rate=3167 × 10%=317

Amortization=Payment-Interest Exp.=1000-317=683

## Comparison between FL&OL——I/S

| Capital lease | | | Operating lease |
|---|---|---|---|
| Depreciation expense | Interest expense | Total expense | Lease expense |
| 792.50 | 317 | 1109.5 | 1000 |
| 792.50 | 249 | 1041.5 | 1000 |
| 792.50 | 174 | 966.5 | 1000 |
| 792.50 | 91 | 883.5 | 1000 |
| 3170 | 830.00 =4000-3170 | 4000 | 4000 |







## Comparison between FL&OL——CFS

| | Operating lease | Finance lease | | |
|---|---|---|---|---|
| Year | CFO | CFO | CFF | Total CF |
| 1 | 1,000 | 317 | 683 | 1,000 |
| 2 | 1,000 | 249 | 751 | 1,000 |
| 3 | 1,000 | 174 | 826 | 1,000 |
| 4 | 1,000 | 91 | 910 | 1,000 |
| **Total** | **4,000** | | | **4,000** |
| | Rental<br>**Stable p.a.** | Interest expense<br>**Decreasing** | Lease payment - interest expense<br>**Increasing** | Rental<br>**Stable p.a.** |







## Effect on financial statements

| | | Finance lease | Operating lease |
|---|---|---|---|
| B/S | Assets | Higher | Reverse |
| | Liabilities | Higher | |
| I/S | EBIT | Higher | |
| | Net income in early years | Lower | |
| | Net income in later years | Higher | |
| | Total net income | Same | Same |
| CFS | CFO | Higher | Reverse |
| | CFF | Lower | |
| | Total CF | Same | Same |

## Effect on ratios

| | Finance lease | Operating lease |
|---|---|---|
| Current ratio (↑Current Liab) | Lower | Reverse |
| Working capital (↑Current Liab) | Lower | |
| Asset turnover (↑Asset) | Lower | |
| ROA (in early years) (↓NI) | Lower | |
| ROE | Lower | |
| Debt/asset (↑Liab) | Higher | |
| Debt/equity(↑Liab) | Higher | |





## Classification of lease: lessor

| Lessee | | Lessor |
|---|---|---|
| •Operating lease | → | •Operating lease |
| Finance lease | Two additional conditions are not satisfied → | •Operating lease |
| | Two additional conditions are satisfied → | •Capital lease<br>•If manufacturer, sales-type lease<br>•If for financing, direct-financing lease |





## Classification of lease: lessor

- **From the lessor's perspective**
  - **Under U.S. GAAP**, a **capital lease** is treated
    - ✓ **Sales-type lease**
      - ◆Present value of the lease payments >carrying value of the asset.
    - ✓ **Direct financing lease**
      - ◆Present value of the lease payments = carrying value.
  - **Under IFRS**
    - ✓ **No distinction** between a sales-type lease and a direct financing lease;
    - ✓ A sales-type lease **can** be used for finance leases originated by manufacturers or dealers;
    - ✓ Generally, present value of the lease payments > the carrying value of the asset.

## Pension plans*

| Defined contribution plans | Defined benefit plan |
|---|---|
| The employee assumes all the investment risk | The employer assumes all the investment risk |

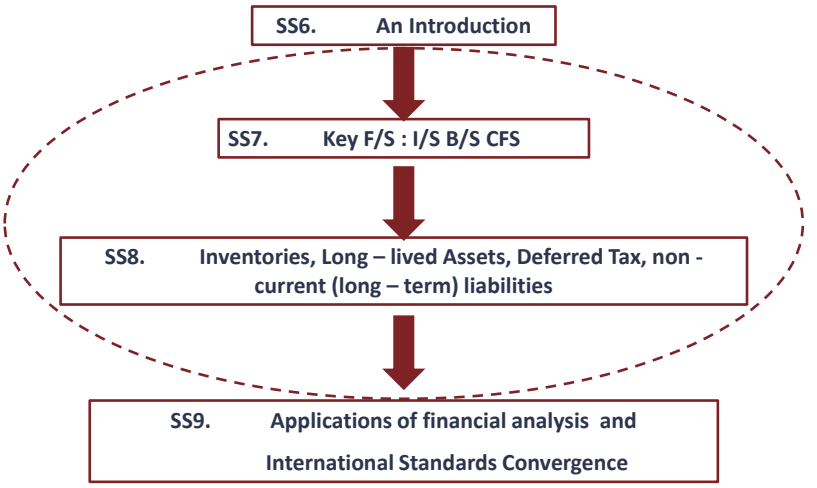

Employer paid the **contribution** during the employee service period

Employees receive **benefit** after retirement





## FRA structure








## Framework

**Corporate Finance**

- **SS10 Process, Asset Allocation, and Risk Management**
  - R34: Corporate governance and ESG: An Introduction
  - R35: Capital Budgeting
  - R36: Cost of Capital
- SS11 Economic Analysis, Active Management, and Trading
  - R37: Measures of leverage
  - R38: Dividends and Share Repurchases: Basics
  - R39: Working Capital Management


**Corporate governance and ESG:**
**An Introduction**





## Framework

1. Corporate governance overview
2. Various stakeholder groups
3. Principal–Agent and Other Relationships Corporate Governance
4. Stakeholder management
5. Board of directors
6. Committees
7. Factors affecting stakeholder relationships and Corporate Governance
8. Risks of Poor Governance
9. Benefits of Corporate Governance
10. Analyst Considerations
11. ESG Considerations for Investors





## Corporate governance

- **Corporate governance** is the internal system including checking, balancing and incenting various parties, which could minimized and manage the conflicting interests between insiders and shareholders.
- **Corporate governance systems** adopted are either **shareholder theory or stakeholder theory**
  - **Shareholder theory** takes the view that the most important responsibility of a company's managers is to maximize shareholder returns;
  - **Stakeholder theory** broadens a company's focus **beyond** the interests of only its shareholders to its customers, suppliers, employees, and others who have an interest in the company.
- Notwithstanding the system of corporate governance used, nearly all companies depend on contributions from **a number of** stakeholders for their **long-term success.**

## Various stakeholder groups

- **Shareholders**
  - Owner; Residual interest;
  - **Growth** in corporate profitability to maximize a company's value.
- **Creditors**
  - Providers of debt financing, entitled to predetermined interest and principal;
  - **Stability** of company's operation and performance;
  - Potential Conflict with shareholders: Shareholder prefer **higher** risk and return.
- **Managers and Employees**
  - Receive compensation; Job promotion and working environment;
  - Interest in company's **viability;**
  - Potential conflict with shareholders (E.g. **Take over offer).**
- **Board of Directors**
  - Protect shareholder's interest, strategic direction, monitor performance;
  - **Experienced** individuals that fulfill responsibility toward shareholders and company;
  - Maintain good reputation.





## Various stakeholder groups

- **Suppliers**
  - Delivery goods to company on credit;
  - Wish to have long-term relationship with company;
  - Company's ability to generate cash flow to meet its financial obligations.
- **Customers**
  - Ongoing support, with long-term relationship with the company;
  - Satisfy their needs with a given price and safety standards;
  - Company's **stability.**
- **Governments/Regulators**
  - Protect the interest of general public, and ensure well-being of their nation's economies;
  - **Comply** with applicable laws (tax).





## Principal–agent and other relationships

- **A principal hires an agent to perform on behalf of the principal.**
  - **Objectives**
    - ✓ Agent is expected to act in the best interests of the principal.
  - **Duty of manager**
    - ✓ Act in the best interests of shareholders by maximizing equity value.
  - **Conflict**
    - ✓ Managers may seek to maximize their personal benefits to the detriment of shareholders' interests.

## Principal–agent and other relationships

- **Reasons for conflict interests between shareholder, manager, board**
  - **Different risk tolerance for shareholders and managers**
    - ✓ **Shareholder** with diversified investment portfolios may have a **relatively high risk tolerance**;
    - ✓ **Managers** and director more **risk averse** to protect their employment status.
  - Manager can make strategic decision in favor of themselves due to **"information asymmetry"**;
  - Board is **influenced** by insiders;
  - Directors favor certain **influential shareholders** over other shareholders.





## Principal–agent and other relationships

- **Controlling and Minority Shareholder Relationships**
  - **Straight voting**, leave minority shareholders less representation on the board.
  - **Controlling shareholders'** decision might have **impact** on minority shareholder's wealth.
    - ✓ E.G. **takeover** transactions might give favor deal to controlling shareholders;
    - ✓ E.G. **related-party** transactions provide controlling shareholders interest ahead minority shareholders' interests, not for the company's best interests.
  - The **multiple-class structure** enables controlling shareholders to mitigate dilution of their voting power when new shares are issued.
- **Shareholder and creditor relationships**
  - **Difference risk tolerance**
    - ✓ **Shareholders** would likely prefer riskier projects with a strong likelihood of higher return potential;
    - ✓ **Creditors** would likely prefer stable performance and lower-risk activities.





## Principal–agent and other relationships

- **Other stakeholder conflicts**
  - Conflict between **customers** and **shareholders**
    - ✓ E.G. A company decides to charge a high price for its products or reduces product safety features to reduce costs.
  - Conflict between **customers** and **suppliers**
    - ✓ A company offers overly lenient credit terms to its customers, whereby the company's ability to repay suppliers on time may be affected.
  - Conflict between **shareholders** and **governments or regulators**
    - ✓ E.G. accounting policy to reduce tax burden;
    - ✓ E.G. bank's shareholders preferring a lower equity capital base while regulators prefer a higher capital position.

## Stakeholder management

- **Stakeholder management involves identifying, prioritizing, and understanding the interests of stakeholder groups, and, on that basis, managing relationship with it.**
- **In general**
  - **Communication** and active engagement;
  - **Balance** their interests and limit the impact of conflicts.
- **Corporate governance and stakeholder management frameworks**
  - Legal infrastructure defines rights established by law;
  - The contractual infrastructure is shaped by the contractual arrangements entered;
  - The organizational infrastructure refers to internal systems, governance procedures, and practices adopted and controlled by the company in managing its stakeholder relationships;
  - Lastly, the governmental infrastructure refers to regulations imposed on companies.





## Stakeholder management

- **Mechanisms of stakeholder management**
  - General meetings
    - ✓ AGM simple majority;
    - ✓ Extraordinary general meeting- supermajority vote.
  - Board of director mechanisms
  - The audit function
  - Reporting and transparency
  - Policies on related-party transactions
  - Remuneration policies
  - Say on pay
  - Employee laws and contracts
  - Contractual agreements with customers and suppliers
  - Laws and regulations





## Board of directors

- **Composition of the board of directors**
  - Factors: company size, structure, and complexity of operations;
  - Corporate governance codes require: board include a diverse mix of expertise, backgrounds, and competencies-qualifications.
- **One tier:** comprise a mix of executive and non-executive directors;
- **Two tier:** the supervisory and management boards are independent from each other (Ex: separation of CEO and chairman).
- **Staggered boards**
  - **Directors** are typically divided into **three classes** that are elected separately in consecutive years-one class every year;
  - **Purpose**: limits their ability to effect a major change of control at the company.

# Board of directors

- **Functions and responsibilities of the board**
  - Directors' responsibilities are the duty of care and the duty of loyalty;
  - Board Directors elected by shareholders **guide strategic direction and oversee management's performance;**
  - Board ensures **leadership** continuity though succession **planning** for the CEO and other key executives;
  - Board delegate activities to **management**- implement strategic;
  - Board evaluate performance-**align** executive directors with long-term interests of the company;
  - Board ensuring the effectiveness of the company's **audit and control systems;**
  - Board adopts and implements proper **corporate governance principles** and complies with all applicable internal and external **laws and regulations**, including **ethical standards**;
  - Board ensures company has an appropriate enterprise **risk management system** in place, whereby risks are identified, mitigated, assessed, and managed appropriately.





# Committees

- **Board committee**
  - **Audit committee**
    - ✓ Committee member independence;
    - ✓ Committee member qualification;
    - ✓ Independent auditor (internal & external).
  - **Remuneration/ compensation committee**
    - ✓ Committee member independence;
    - ✓ Appropriate executive compensation packages;
    - ✓ Reasonable option schemes.
  - **Nominations committee**
    - ✓ Committee member independence;
    - ✓ Creating nomination procedures and policies;
    - ✓ Recruiting qualified board members;
    - ✓ Regularly reviewing performance, independence skills, and experience of existing board members.





# Committees

- **Board committee**
  - **Governance committee**
    - ✓ Develop and oversee the implementation of the **corporate governance code**, the **charters** of the board and its committees, and the company's **code of ethics** and **conflict of interest policy**;
    - ✓ Reviews regularly, monitoring the implementation;
    - ✓ Recommends remedial actions.
  - **Risk committee**
    - ✓ Determines **the risk policy, profile, and appetite** of the company;
    - ✓ Establishes ERM and monitors their implementation;
    - ✓ **Supervises** the risk management functions in the company, receives regular reports, and reports on its findings and recommendations to the board.
  - **Investment committee**
    - ✓ **Reviews** material investment **opportunities** proposed by management and considers their **viability** for the company;
    - ✓ Establishing and revising the **investment strategy and policies** of the company.

## Factors affecting stakeholder relationships

- **Market Factors**
  - **Shareholder engagement** involves a company's **interactions** with its shareholders;
  - **Shareholder activism** describes the efforts by **shareholders** to create a change within a corporation or modify a corporation's behavior;
  - **Competitive dynamics** can help align managerial interests with those of its stakeholders.
- **Non-market factors**
  - Legal environment
    - ✓ Common law system;
    - ✓ Civil law system.
  - The media
  - The corporate governance industry





## Factors affecting stakeholder relationships

- **Market Factors**
  - **Shareholder engagement** involves annual shareholder meeting and analyst calls, the **scope** of which was limited to financial and strategic matters.
    - ✓ In order to building **support against** short-term activist investors, countering negative recommendations from proxy advisory firms, and receiving greater support for management's position.
  - **Shareholder activism** describes strategies used by shareholders to attempt to **compel** a company to act in a desired manner.
    - ✓ **Aims:** Maximize shareholder value.
    - ✓ **Manner**
      - ◆Tactics as initiating proxy battles (fights), proposing shareholder resolutions;
      - ◆Publicly raising awareness on issues of contention;
      - ◆Shareholder derivative lawsuits (shareholders against board or management with thought of behaviors of them is not for benefit of the company and shareholders); e.g. Hedge funds.
  - **Competitive dynamics** can help **align** managerial interests with those of its stakeholders.
    - ✓ Preservation of employment status vs. against takeover. E.g. Staggered board; Poison pill.





## Factors affecting stakeholder relationships

- **Non-market factors**
  - **Legal environment**
    The key difference between the two systems lies in the ability of a judge to create laws.
    - ✓ Civil law system, the role of judges is generally **limited** to rigidly **applying** the statutes and codes to the specific case brought before the court;
    - ✓ Common law systems, laws are created both from statutes enacted by the legislature and by judges through judicial opinions.
  - **The media**
    - ✓ Social media has become a powerful tool that stakeholders have increasingly used to protect their interests or enhance their influence on corporate matters.
  - **The corporate governance industry**
    - ✓ **External corporate governance services**- outside experts to assist with corporate governance monitoring and proxy voting (proxies would be voted in the best interests of their clients).

## Risks of poor governance

- **Risks of poor governance and stakeholder management**
  - **Weak control systems**
    - ✓ In a company with weak control systems or inefficient monitoring tools, such as poor audit procedures or insufficient scrutiny by the board, one stakeholder group may benefit at the expense of the company or other stakeholders.
  - **Ineffective decision making**
    - ✓ In the absence of sufficient monitoring tools, managers have an opportunity to make decisions that benefit themselves relative to the company or shareholders.





## Risks of poor governance

- **Risks of poor governance and stakeholder management**
  - **Legal, regulatory, and reputational**
    - ✓ Compliance weaknesses in the implementation of regulatory requirements or lack of proper reporting practices may expose the company to legal, regulatory, or reputational risks.
  - **Default and bankruptcy risks**
    - ✓ Poor corporate governance, including weak management of creditors' interests, can affect the company's financial position and may hinder its ability to honor its debt obligations.





## Benefits of effective governance

- **Benefits of effective governance and stakeholder management**
  - **Operational efficiency**
    - ✓ When balanced with adequate internal control mechanisms, the governance structure can ensure that corporate decisions and activities are properly monitored and controlled to mitigate risk and help improve the operational efficiency of the company.
  - **Improved control**
    - ✓ By adopting procedures for monitoring compliance with internal policies and external regulations and for reporting any violations, the company can better mitigate regulatory or legal risks and their associated costs;
    - ✓ Additionally, the adoption of formal procedures with regard to conflicts of interest and related-party transactions allows the company to ensure fairness in its relationships with those parties.

## Benefits of corporate governance

- **Benefits of effective governance and stakeholder management**
  - **Better operating and financial performance**
    - ✓ Good governance and stakeholder management can help a company improve its operating performance and reduce the costs;
    - ✓ Enhanced corporate governance could also allow the company to improve its decision-making process and respond faster to market factors;
    - ✓ Proper remuneration policies are another governance tool that can motivate managers to make decisions with the objective of creating corporate value.
  - **Lower default risk and cost of debt**
    - ✓ Proper functioning of audit systems, improved transparency (e.G., Reporting of earnings), and the control of information asymmetries between the company and its capital providers can mitigate default risk.





## Analyst considerations

- **Analyst considerations in corporate governance and stakeholder management**
  - **Economic ownership and voting control**
    - ✓ **Dual-class structures:** voting power is decoupled from ownership common shares may be divided into two classes, one of which has superior voting rights to the other.
      - ◆A **common arrangement** is when a share class carries one vote per share and is publicly traded whereas another share class carries several votes per share and is held exclusively by company insiders or family members. (E.G. Facebook)
      - ◆Another mechanism used to separate voting control from economic ownership is when one class of stock (held by insiders) elects a majority of the board. (E.G. Alibaba)





## Analyst considerations

- **Analyst considerations in corporate governance and stakeholder management**
  - **Economic ownership and voting control**
    - ✓ **Proponents and critics about dual-class structures**
      - ◆**Proponents** of dual share systems, argue that the systems promote company stability and enable management to make long-term strategic investments, insulated from the short-term pressures of outside investors;
      - ◆**Critics** of these structures believe they create conflicts of interest between the providers of capital and the management of the business.

# Analyst considerations

- **Analyst considerations in corporate governance and stakeholder management**
  - **Board of directors representation**
    - ✓ Analysts can assess the available information to determine whether the experience and skill sets on the board match the current and future needs of the company.
  - **Remuneration and company performance**
    - ✓ Analysts can assess the elements of the remuneration program to determine whether they support or conflict with the key drivers of performance for the company.
  - **Investors in the company**
    - ✓ The behavior of investors can result in both limitations and catalysts with regard to changes in the corporation;
    - ✓ Analysts should note that market context is important in assessing the potential effects of affiliated stockholders.





# Analyst considerations

- **Analyst considerations in corporate governance and stakeholder management**
  - **Strength of shareholders' rights**
    - ✓ If an analyst's viewpoint includes the possibility that a company will merge in the future, he or she may want to understand whether there are significant structural obstacles to transactions that are embedded in the company's charter or bylaws;
    - ✓ Similarly, if the thesis involves an outside catalyst, such as **an activist shareholder** who will introduce change at the company and improve performance, the analyst must take a position on whether shareholders are sufficiently empowered to advance such a change;
    - ✓ If it is impossible for shareholders to remove directors from the board or to convene special stockholder meetings, it will be difficult for external initiatives to be successful.





# Analyst considerations

- **Analyst considerations in corporate governance and stakeholder management**
  - **Managing long-term risks**
    - ✓ Analysts may uncover useful insights regarding how a company manages various issues, such as long-term environmental risks, management of human capital, transparency, and treatment of investors and other stakeholders;
    - ✓ One way to approach management quality issues is to assess whether the company demonstrates a persistent pattern of fines, accidents, regulatory penalties, investigations, and the like.

## ESG considerations for investors

- **ESG definition**
  - The practice of considering **environmental**, **social**, **and governance factors** in the investment process is known as **ESG integration** (sometimes referred to as ESG investing);
  - **ESG integration** can be implemented across all asset classes, including equities, fixed income, and alternative investments. The consideration of relevant and material ESG factors can lead to a more comprehensive understanding of a company's risks.





## ESG considerations for investors

- **ESG integration**
  - **Sustainable investing (SI)** and **responsible investing** are sometimes used interchangeably with ESG integration. In general, SI and RI refer to the practice of considering ESG factors in the investment process;
  - **Socially responsible investing (SRI)**. SRI has historically represented the practice of excluding companies and industries that are in opposition to an investor's moral or ethical values, such as weapons or tobacco;
  - **Impact investing** seeks to achieve targeted social or environmental objectives along with measurable financial returns through engagement with a company or by direct investment in projects or companies.





## ESG considerations for investors

- **Organizations to monitor and advance the mission of sustainable investing**
  - The Global Reporting Initiative (GRI);
  - Principles of Responsible Investment (PRI);
  - Sustainability Accounting Standards Board (SASB);
  - Global Sustainable Investment Alliance (GSIA).

## ESG considerations for investors

- **ESG factors in investment analysis**
  - **Environment factor**
    - ✓ A primary concern among investors is the existence of "stranded assets," or carbon assets at risk of no longer being economically viable because of changes in regulation or investor sentiment.
  - **Social factor**
    - ✓ Considered in ESG integration generally pertain to human rights and welfare concerns in the workplace, product development, and, in some cases, community impact.





## ESG considerations for investors

- **ESG implementation methods**
  - **Negative screening** refers to the practice of excluding certain sectors, such as companies engaged in fossil fuel extraction or production, or excluding companies that violate accepted standards in such areas as human rights or environmental concerns;
  - **Positive screening** aims to identify companies that embrace solid ESG-related principles in their operations and strategies, such as companies with policies that promote human dignity through employee rights, workplace well-being, and concern for the safety of customers.





## ESG considerations for investors

- **ESG Implementation methods**
  - **The best-in-class approach** seeks to identify the best ESG-scoring companies in each industry. Best-in-class approaches do not exclude any industries but instead focus on finding the best representation within each sector;
  - **Thematic investing strategies** typically consider a single factor, such as energy efficiency or climate change;
  - **Impact investing**, is evolving with the increased realization that the goals of positive social and environmental impact can be consistent with economic profit generation.

# Reading 35

## Capital Budgeting





## Framework

1. Capital budgeting process
2. Categories of capital budgeting projects
3. Five basic principles
4. Evaluation and selection between capital projects
5. Methods to evaluate a single capital project
6. Factors affect choosing capital budgeting methods
7. Relations among NPV and share price





## The basic of capital budgeting

- **Classification of capital projects**
  - **Replacement projects**
    - ✓ To maintain the current business;
    - ✓ For cost reduction purpose.
  - **Expansion projects**
    - ✓ For current projects;
    - ✓ For new product or new services.
  - **Mandatory investment**
    - ✓ Regulatory projects;
    - ✓ Safety projects;
    - ✓ Environmental projects;
    - ✓ Frequently required by a government agency.
  - **Other projects:** projects that cannot be easily analyzed by using capital budgeting process.

# Basic principles of capital budgeting

- **Basic principles of capital budgeting**
  - **Incremental cash flow:** the cash flow that is realized because of adopting the projects.
  - Decisions are **based on cash flows**, instead of accounting net income.
    - ✓ Accounting net incomes usually reduced by non-cash charges like depreciations.
  - Timing of cash flows are crucial → Time value of money
    - ✓ When cash flows occur should be accurately analyzed.
  - Cash flows are analyzed on an after-tax basis.
    - ✓ Taxes must be fully reflected in all capital budgeting decisions.





# Basic principles of capital budgeting

- **Basic principles of capital budgeting**
  - Cash flows that **should be ignored** in capital budgeting
    - ✓ **Sunk costs**: the costs have already been incurred, which would not be affected by the decision of adopting the project;
    - ✓ **Financing costs**: the costs have already been reflected in the required rate of return.
  - Cash flows that **should be included** in capital budgeting
    - ✓ **Externality:** the effect of an investment on other things besides the investment itself.
      - ◆Negative externality (cannibalization): the new project may take sales away from current projects;
      - ◆Positive externality: the new project may benefit current projects.
    - ✓ **Opportunity cost:** the cash flow that a firm will lose by the next best use of the resources.





# Mutually exclusive VS independent project

- **Independent Projects**
  - Cash flows are independent of each other;
  - Evaluated based on the projects' own profitability.
- **Mutually Exclusive Projects**
  - Cash flows are compete directly with each other;
  - Only one of the project will be chosen;
  - Rank all alternatives and select the best one.
- **Project Sequencing**
  - Projects are sequenced through time, so that investing in a project creates the option to invest in future projects.
- **Unlimited Funds**
  - Company can raise the funds it wants for all profitable projects by paying the required rate of return.
- **Capital rationing**
  - Company has a limited amount of funds to invest.

# Project evaluation methods

- **Net present value (NPV)**
- **Internal rate of return (IRR)**
- **Payback period (PBP)**
- **Discount payback period (DBP)**
- **Profitability index (PI)**





# Project evaluation methods - NPV

- **Definition**
  - PV of the future after-tax cash flows minus the investment outlay;
  - Net Present Value (NPV) = Total PV of future CF's - Initial cash outlay
- **Decision rule**
  - For independent projects
    - ✓ If NPV>0, increase wealth, Accept;
    - ✓ If NPV<0, decrease wealth, Reject.
  - For mutually exclusive projects
    - ✓ Choose the one with highest NPV.
- **Advantage**
  - Shows the amount of gains as currency amount;
  - Positive NPV of project adds value to the firm (or to shareholders) rather than creditors (Creditors only gain the interest whatever project bring benefits or losses);
  - Realistic discount rate – Included opportunity cost of funds (the expected return of stockholders).
- **Disadvantage**
  - Size of projects ignored





# Project evaluation methods - IRR

- **Definition**
  - The discount rate that makes the present value of the future after-tax cash flows equal that investment outlay.
- **Decision rules**
  - For independent projects

    Invest if IRR $\geq$ the required date of return

    Reject if IRR $\leq$ the required rate of return
  - For mutually exclusive projects
    - ✓ Choose the highest IRR
- **Advantage**
  - Reflect the profitability (not reflect absolute amount of profit gain);
  - Comparable for projects with different size.
- **Disadvantage**
  - Assume the reinvestment rate is IRR;
  - No IRR & multiple IRR;
  - Conflicting ranking results of mutually exclusive projects with NPV.

## Project evaluation methods - PB

- **Definition**
  - The number of years it takes to recover the initial cost of a project.
- **Decision rules**
  - Mutually exclusive
    - ✓ Invest the one with shorter PBP.
  - Independent project
    - ✓ If project PBP < benchmark PBP, accept.
- **Advantages**
  - Simple;
  - An indication of a project's risk and liquidity.
- **Disadvantages**
  - Ignores the time value of money;
  - Ignores cash flows after the payback period;
  - Ignores the profitability of the project.





## Project evaluation methods - DPB

- **Discounted Payback Period (DPB)**
  - **Definition**
    - ✓ The number of years it takes for the cumulative discounted cash flows from a project to equal the original investment.
  - **Decision Rules**
    - ✓ For mutually exclusive projects
      - ◆Invest the one with shorter PBP.
    - ✓ For independent project projects
      - ◆If project PBP < benchmark PBP, accept.
  - **Advantages**
    - ✓ An indication of a project's risk and liquidity;
    - ✓ Considers time value of money.
  - **Disadvantages**
    - ✓ Ignores cash flows after the payback period. Also the drawback of PBP.





## Project evaluation methods- PI

- **Profitable Index (PI)**

$$PI=\frac{\text{PV of future cash flow}}{CF_0}=1+\frac{NPV}{CF_0}$$

- **Definition**
  - The PV of a project's future cash flows divided by the initial investment.
- **Decision rule**

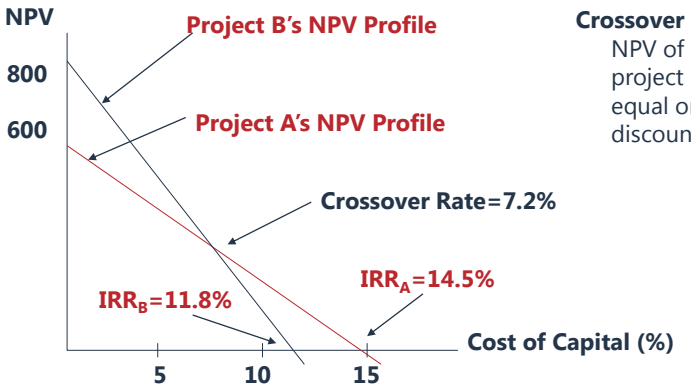
Invest if PI>1.0

Reject if PI<1.0

- **Advantage**
  - Measures profitability of the project.
- **Disadvantage**
  - Not reflect the absolute amount of profit gain of the project.

## NPV profiles

- **The NPV profile shows a project's NPV graphed as a function of various discount rates.**




**Crossover Rate**: NPV of each project are equal on this discount rate.

When NPV and IRR conflicts: **NPV dominates.**





## NPV & IRR calculation

- **NPV is superior to IRR**
  - **Advantages of NPV & IRR**
    - ✓ Based on Cash flows;
    - ✓ Considering Time value of money——Opportunity cost;
    - ✓ Take into account the cash flows generated over the whole project life.
  - **Disadvantages of IRR**
    - ✓ Conventional cash flows pattern Vs. Unconventional cash flow pattern.
      - ◆Multiple IRRs or no IRR under unconventional CF.
    - ✓ Unrealistic reinvestment assumption.
  - **Disadvantage of NPV**
    - ✓ Size of project ignored.
  - Key advantage of NPV
    - ✓ Consistent with the goal of shareholders wealth maximization.



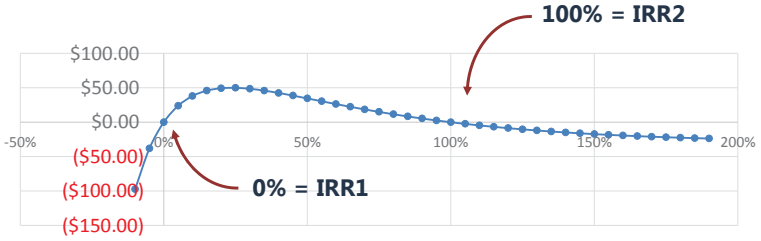


## NPV & IRR calculation

- **Multiple IRRs**

**There are two IRRs for this project:**


**Which one should we use?**



## Popularity of capital budgeting methods

- **Location**
  - European countries use the payback period method as much as or more than NPV and IRR methods.
- **Size of the company**
  - Larger companies tended to prefer the NPV and IRR over the payback period.
- **Public and Private**
  - Private companies used the payback period more often than did public ones.
- **Management education**
  - The higher the level of education (i.e., MBA), the more likely the company was to use discounted cash flow methods such as the NPV and IRR.





## Impact of NPV rule and stock price

- **The relationship for NPV of the project and firm's value**
  - **NPV is positive**
    - ✓ Firm value is increased;
    - ✓ Shareholder wealth is increased.
  - **NPV is zero**
    - ✓ Shareholder wealth remain constant.
  - **NPV is negative**
    - ✓ Shareholder wealth is decrease.
- **The relationship between NPV rule and the stock price**
  - **In theory**
    - ✓ When the NPV is positive, $P_{stock}$ is increased, vice versa;
    - ✓ △price per share=NPV/ outstanding common shares.





## Impact of NPV rule and stock price

- **In reality**
  - The impact of the projects' NPV on stock price is much complicated than it illustrated previously;
  - The value of a firm= the value of its existing investments+ NPV of its future investments;
  - The impact of the investments on stock price depends on whether the NPV of the project is higher or lower than initial expectation, but not the project's NPV;
  - For example, if a project has NPV of $3.5, it might be a positive signal for investors as the company may have other profitable investment opportunities. Thus the increase of the stock price may increase more than $3.5.

# Reading 36

## Cost of Capital





## Framework

1. Weighted average cost of capital (WACC)
   - Component cost of capital
   - Calculating WACC and it's components
   - Target capital structure weights
2. Project's and non-public company's beta
3. Country risk premium
4. Optimal capital budget
5. Floatation cost



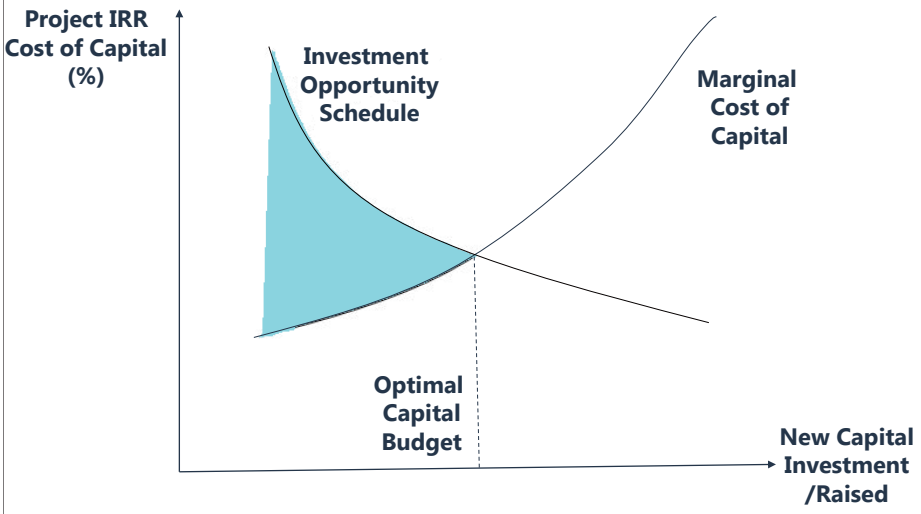


## Weight average cost of capital （WACC）

$$WACC = (w_d)[r_d(1-t)] + (w_{ps})(r_{ps}) + (w_{ce})(r_s)$$

- **Where**
  - **t** is the company's marginal tax rate;
  - **w** is the proportion of each type of capital when it raises new funds;
  - **r** is the marginal cost of each type of capital.
- **The priority sequencing of choosing capital structure**
  - The company's target capital structure;
  - The trends in capital structure;
  - The company's current capital structure;
  - The average of comparable company's capital structure.

## The optimal capital budget








## The optimal capital budget

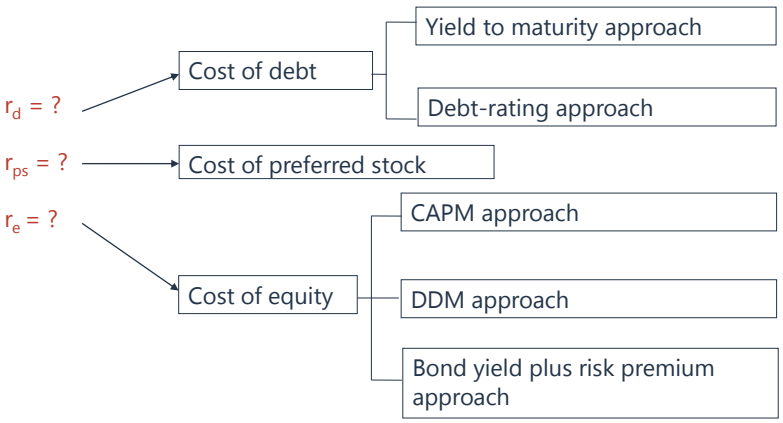
- **The WACC is the appropriate discount rate for projects that have approximately the same level of risk as the firm's existing projects.**
  - If a project's risk >firm's risk , use a discount rate greater than WACC
    →NPV overestimated if using WACC;
  - If a project's risk <firm's risk , use a discount rate lower than WACC
    →NPV underestimated if using WACC.





## Cost of the different sources of capital

- The weights in the calculation of WACC should be base on the firm's target capital structure.



# Cost of debt

- **After-Tax Cost of Debt**

$$r_d(1\text{-}t) = \text{interest rate-tax saving}$$

- **Use the market interest rate on new debt, not the coupon rate**
  - **Yield to maturity approach (annual return)**
    - ✓ N=3, PV=-1025, PMT= 100, FV=1000 CPT I/Y
    - ✓ CF CF0=-1025, C01=100, F01=2, C02=1100 IRR CPT（容易犯错）
  - **Debt-rating approach**





# Cost of preferred stock

- **Cost of Preferred Stock**

$$r_{ps} = \frac{D_{ps}}{P}$$

**Where**

- D: preferred dividends;
- P: market price of preferred stock.
- If the preferred stock has option features like convertible or callable, how to figure out its cost?





# Cost of equity

- **Cost of Equity**
  - **CAPM approach**
    - ✓ $r_s = r_f + \beta(r_m - r_f)$
  - **Dividend growth model**
    - ✓ $r_s = (D_1/P_0) + g$
    - ✓ g=(1-payout rate) (ROE)
  - **Bond yield plus risk premium approach**
    - ✓ $r_s$= bond yield + risk premium

# Cost of equity: CAPM approach

$$r_s = r_f + \beta(r_m - r_f)$$

- **Estimate risk free rate**
  - Risk free asset is defined as an asset that has no default risk;
  - A common proxy for the risk-free rate is the yield on a default free government debt instrument.
- **Estimate market risk premium:** $[E(r_m) - r_f]$
  - The premium that investors demand for investing in a market portfolio relative to the risk-free rate.
- **Estimate beta**

$$\beta = \frac{Cov(i,\ m)}{\delta_m^2}$$





# Capital asset pricing model (CAPM)

- **Beta and cost of capital**
  - Beta is affected by the systematic components of business and financial risks.
  - Business risk
    - ✓ The risk related to the uncertainty of revenues, referred to as **sales** risk, and to **operating risk.**
      - ◆Sales risk is affected by the elasticity of the demand of the product;
      - ◆ Operating risk is affected by the relative mix of fixed and variable operating costs.
  - Financial risk
    - ✓ Fixed cost from using debt and leases brings uncertainty to net income and net cash flows.
  - Project beta ➔systematic risk.
  - Beta can be observed from firms in the same investment class as the proposed investment.





# Cost of equity: pure-play method

- **How to estimate beta of a non-public company?**
  - A two-step process is used (pure-play method)
    - ✓ Step 1: Convert the observed, equity beta of the comparable public company, into an asset beta, or pure project beta, $\beta_u$. Removing the effects of financial leverages;

$$\beta_{asset}^{*} = \beta_{equity}\left[\frac{1}{1+(1-t)\frac{D}{E}}\right]$$

    - ✓ Step 2: Calculate the new equity beta of this non-public company for the proposed capital structure of the new line of business.

$$\beta_{equity} = \beta_{asset}^{*}\left[1+(1-t')\frac{D'}{E'}\right]$$

# Cost of equity: country risk premium

- **Country equity risk premium in developing market**
  - $r_{ce} = R_f + \beta[E(R_{mkt}) - R_f + CRP]$
    - ✓ CRP: country risk premium

求$r_e$，考虑的是股票市场，所以equity在分子上

$$CRP = \text{Sovereign yield spread} \times \frac{\sigma_{\text{equity index}}}{\sigma_{\text{sovereign bond market of developed market currency}}}$$

- **Sovereign yield spread**
  - The difference between the government bond yield in that country, denominated in the currency of a developed country, and the treasury bond yield on a similar maturity bond in the developed country.





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# Cost of equity: dividend discount model

- **Dividend discount model**
  - $P_0 = D_1 / (r_{ce} - g)$
  - **Assumption**
    - ✓ $r_{ce} > g$

- **$r_{ce} = D_1 / P_0 + g$**
  - $D_1 / P_0$: dividend yield;
  - g = (retention rate) (ROE) = (1-PR) (ROE);
  - PR=Payout ratio = D/EPS.





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# Cost of equity: bond yield+ risk premium

- **Bond yield plus risk premium approach**
  - Based on fundamental tenet in financial theory that the cost of capital of riskier cash flows is higher than that of less risky cash flows.
- **$r_{ce}$= bond yield + risk premium**

  Where:

  Bond yield = market yield on the firm's long-term bond;

  Risk premium = historical spreads between bond yield and stock yield.
- **Risk premium estimation**
  - Ideally, the risk premium is forward looking;
  - However, the estimates of this premium is based on the historical spreads;
  - Emerging market, risk premium should be 3-5%.

## Cost of CS & Ps—flotation cost

- **Floatation cost: the costs associated with the issuance of new securities**
  - Charged by investment bank, while based on the size and type of offering;
  - Preferred stock & debt: do not usually incorporate flotation costs in the estimated cost of cost of capital because this cost is quite small < 1%;
  - Common stock: should be considered (about 5%).
- **Method 1**

$$r_e = \frac{D_1}{P_0 - F} + g \quad \textbf{OR} \quad r_e = [\frac{D_1}{P_0(1 - f)}] + g$$

- **Method 2**
  - In fact, floatation costs are a cash flow at the initiation of the project Consider as $CF_0$.





# Reading 37

**Measures of leverage**





## Framework

1. Basic concept of leverage
2. Leverage
   - Degree of operating leverage (DOL)
   - Degree of financial leverage (DFL)
   - Degree of total leverage (DTL)
3. Breakeven quantity
   - Breakeven quantity of sales
   - Operating breakeven quantity of sales

## Leverage and risk

- **Leverage** is the use of fixed costs, operating or financial, in a company's structure. It increases the risk and potential return of a firm's earnings and cash flows.
  - Operating leverage results from fixed operating cost;
  - Financial leverage results from the use of debt financing and its associated fixed costs.
- **Business risk** is the risk associated with operating earnings (EBIT) and results from a combination of sales risk and operating risk.
  - **Sales risk**: the uncertainty with respect to the price and quantity of goods and services;
  - **Operating risk**: risk attributed to the operating cost structure, the greater the fixed costs relative to variable costs, the greater the operating risk.
- **Financial risk** is reflected in the greater variability of EPS compared to the variability of operating earnings (EBIT) as a result of using debt in the firm's capital structure.





## Operating leverage

- **Degree of operating leverage (DOL)**
  - **Definition**
    - ✓ The degree of operating leverage can be regarded as the operating income elasticity, which is the percentage change in EBIT that results from a given percentage change in sales.
    - ✓ A quantitative measure of operating risk.

$$DOL = \frac{\text{percentage change in EBIT}}{\text{percentage change in sales}} = \frac{\frac{\Delta EBIT}{EBIT}}{\frac{\Delta Q}{Q}}$$

elasticity

  - **Equation**

$$DOL = \frac{Q(P-VC)}{Q(P-VC)-FC} = \frac{S-TVC}{S-TVC-FC}$$





## Financial leverage

- **Degree of financial leverage (DFL)**
  - **Definition**
    - ✓ The sensitivity of the cash flows available to owners when operating income(EBIT) changes.
    - ✓ A quantitative measurement of financial risks.
  - **Equation**

$$DFL = \frac{\text{percentage change in EPS}}{\text{percentage change in EBIT}} = \frac{\frac{\Delta EPS}{EPS}}{\frac{\Delta EBIT}{EBIT}}$$

$$DFL = \frac{\text{EBIT}}{\text{EBIT-Interest}}$$

    - ✓ When interest is zero, DFL=1. There is no financial leverage.

# Financial leverage

- **Degree of total leverage (DTL)**
  - **Definition**
    - ✓ A measure of the sensitivity of net income to changes in the number of units produced and sold;
    - ✓ The ratio gives a combined effect on both operating leverage and financial leverage.

$$DTL=DOL\times DFL$$

$$DTL=\frac{\%\Delta EBIT}{\%\Delta sales}\times\frac{\%\Delta EPS}{\%\Delta EBIT}=\frac{\%\Delta EPS}{\%\Delta sales}$$

  - **Equation**

$$DTL=\frac{Q(P\text{-}VC)}{Q(P\text{-}VC)\text{-}FC\text{-}I}=\frac{S\text{-}TVC}{S\text{-}TVC\text{-}FC\text{-}I}$$

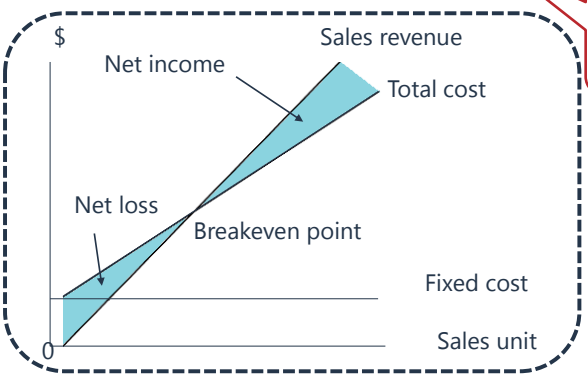




# Breakeven analysis

- **Breakeven quantity of sales ($Q_{BE}$):** the level of sales that a firm must generate to cover all of its fixed and variable costs.

$$Q_{BE}=\frac{\text{fixed operating costs+fixed financial costs}}{\text{price-variable cost per unit}}$$








# Breakeven analysis

- **Operating breakeven quantity of sales ($Q_{OBE}$)**
  - Calculate as breakeven quantity of sales but only consider fixed operating costs and ignore fixed financing cost.

$$Q_{OBE}=\frac{\text{Fixed operating costs}}{\text{Price}-\text{variable cost per unit}}$$

# Reading 38

## Dividends and Share Repurchases: Basics





## Framework

1. Different types of dividends
   - Cash dividend
   - Stock dividend and stock split
   - Reverse stock splits
   - Effects on financial ratios
2. Dividend payment chronology
3. Share repurchase
   - Types
   - Effects on EPS
   - Effects on BVPS

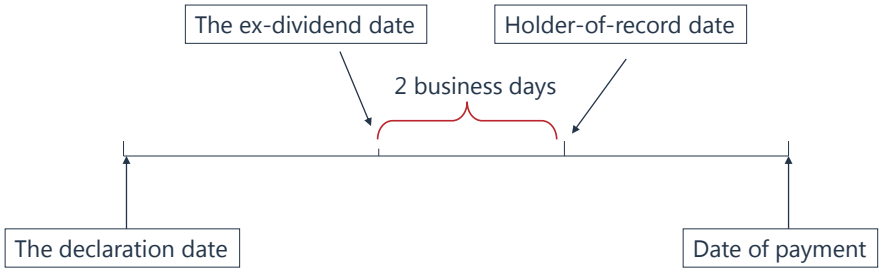




## Dividends

- **Cash dividends**
  - Reduces both the value of the company's assets and the market value of equity;
  - No effect on shareholder wealth.
  - Types of cash dividend
    - ✓ Regular dividends (dividends are paid on a consistent schedule);
    - ✓ Special dividends (dividends are paid irregularly, on cash);
    - ✓ Liquidating dividends (dividends are paid when a company goes liquidating).
- **Stock dividends & stock splits**
  - Both create more shares;
  - A proportionate drop in the price per share;
  - No effect on shareholder wealth.
- **Reverse stock splits**
  - Increase the share price;
  - Reduce the number of shares outstanding;
  - No effect on the market value of the firm's equity.

## Dividend payment chronology




- Once the company sets the record date, the stock exchanges fix the ex-dividend date.
  - Ex-dividend date is normally set for stocks **two business days before** the record date.





## Share repurchase methods

- **Four methods for share repurchase**
  - Buy in the open market
  - Buy a fixed number of shares at a fixed price
  - Dutch Auction
  - Repurchase by direct negotiation
- **Repurchase financed with company's excess cash**
  - Reduce number of shares outstanding → increase EPS
  - Reduce interest income and earnings → decrease EPS
  - Compare earning yield and after-tax yield of company fund
- **Repurchase financed with debt**
  - Reduce number of shares outstanding → increase EPS
  - Incur interest cost and reduce earnings → decrease EPS
  - Compare earning yield and after-tax cost of debt





## Summary

- The **impact** on the indicators due to cash dividend, stock dividend, stock split and repurchase (post vs. pre).

| Indicator | Cash div. | Stock div. | Stock split | Repurchase |
|---|---|---|---|---|
| No. of shares | No changes | Increase | Increase | Decrease |
| Stock price | Ex-div | Ex-div (pro-rata) | Pro-rata decrease | Increased if signal is positive |
| EPS | No change | Decrease | Decrease | Uncertain |
| P/E | Decrease | No change | No change | Uncertain |
| Market value | Decrease by cash paid | No change | No change | Decreased by cash paid |
| Share owned by individual | No changes | Increase | Increase | Depends |
| Ownership value | Decrease in value but same in % of ownership | No changes | No change | Increase |

# Reading 39

## Working Capital Management





## Framework

1. Liquidity Measures
   - Operating cycle and cash conversion cycle
   - Liquidity ratios and turnover ratios
2. Liquidity Management
   - Account receivable management
   - Inventory management
   - Payable management
3. Cash Management
   - Short-term cash investment
   - Short-term cash funding





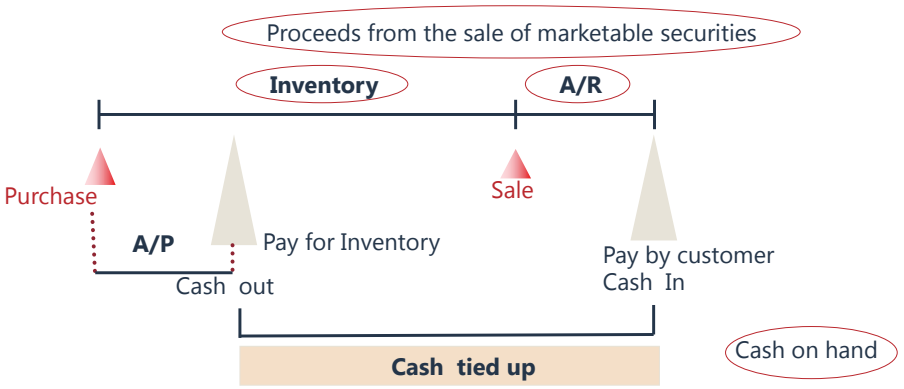
## Liquidity measures

- **Primary sources of liquidity** represent the most readily accessible resources available.
  - Ready cash balances: cash available at bank accounts resulting from payment collections, investment income, liquidation of near-cash securities;
  - Short-term funds;
  - Cash flow management.
- **Secondary sources of liquidity** may result in a change in the company's financial and operating positions.
  - Negotiating debt contracts;
  - Liquidating long-term/ short-term assets with no substantial loss in value;
  - Filing for bankruptcy protection and reorganization.
- **Use of secondary sources may**
  - Signaling a company's deteriorating financial health;
  - Providing liquidity at a high price.

# Liquidity measures

If lack liquidity → Financial distress → Extreme: insolvency or bankruptcy

➢ **Working Capital Turnover**








# Liquidity measures

➢ **Working capital**

Inventory | Accounts Receivable | Accounts Payable | Cash

Current Assets less Current Liabilities = Net Working Capital

➢ **Working capital management is a concern regarding firm liquidity**

- **Drags on liquidity**
  - ✓ When receipts lag, drags on liquidity creates pressure from the decreased available funds.
- **Pulls on liquidity**
  - ✓ Disbursements are paid too quickly or trade credit availability is limited, requiring companies to expand fund before the sales fund comes to cover the liability.





# Liquidity measures

➢ **Drags and Pulls on Liquidity**

- **Drags on liquidity:** involve pressures from credit management and deterioration.
  - ✓ Uncollected receivables;
  - ✓ Obsolete inventory;
  - ✓ Tight credit.
- **Pulls on liquidity:** the liquidity reserves may be stretched thin.
  - ✓ Making payment early;
  - ✓ Reduced credit limits;
  - ✓ Limits on short-term lines of credit;
  - ✓ Low liquidity positions.

## Liquidity measures

- **Operating cycle**
  - A measure of the time needed to convert raw materials into cash from a sale.
    - ✓ **Operating cycle**= days of inventory+ days of receivables;
- **Cash conversion cycle**
  - A measure of the time from paying suppliers for materials to collecting cash from the subsequent sale of goods produced from these supplies.
    - ✓ **Cash conversion cycle**= days of inventory+ days of receivables- days of payables.





## Accounts receivable management

- **Accounts receivable management:**
  - Calculating Average days of A/R based on Receivable aging schedule;
  - Making comparison with Historical trends & Other firms.

| Receivables Aging | | | | |
|---|---|---|---|---|
| Days outstanding | March $ 000's | Weighted | Average Collection Days | Days * Weight |
| <31 days | 200 | 40% | 22 | 8.8 |
| 31-60 days | 150 | 30% | 44 | 13.2 |
| 61-90 days | 100 | 20% | 74 | 14.8 |
| >90 days | 50 | 10% | 135 | 13.5 |
| Weighted Average Collection Period | | | | 50.3 days |





## Inventory management

- **Inventory management**
  - The inventory management needs a trade off: having sufficient inventory in hand for daily running, but not too much;
  - Calculating average days of inventory and inventory turnover ratios;
  - Make comparison
    - ✓ Within the same industry and business strategies
      - ◆Example: Grocery business →high inventory turnover
        An auto parts firm → low inventory turnover

To ensure overall financial management operated effectively, the inventory management is essential in any business.

## Payable management

- **Trade credit:** a delay of payment, with a discount for early payment.
- **Typical terms on trade credit**
  - A discount is allowed if payment is received within a specified date;
  - Otherwise the full amount is due by a specified date.
    - ✓ **For example:** the term "2/10, net 30" means
      - ◆2% discount is available if the account is paid within 10 days;
      - ◆Or the full amount is due in 30 days.

$$\text{Cost of trade credit}=\left(1+\frac{\text{discount}}{\text{1-discount}}\right)^{365/t}-1$$

- Cost of trade credit if paid on day 30 $=(1+\frac{2\%}{1-2\%})^{365/(30-10)}-1$





## Cash management

- **The purpose of managing a firm's daily cash position is to make sure there is sufficient cash ,but to avoid keeping excess cash balances.**
  - U.S. Treasury bills
  - Short-term federal agency securities
  - Bank certificates of deposit
  - Banker's acceptances
  - Time deposits
  - Repurchase agreements
  - Commercial paper
  - Money market mutual funds
  - Adjustable-rate preferred stock

Fixed income





## Cash management

- **The percentage discount from face value is**

$$\%\text{discount}=\left(\frac{\text{FV-P}}{\text{FV}}\right)$$

Quantitative method

- **The discount-basis yield (bank discount yield or BDY) is**

$$\text{discount basis yield}=\left(\frac{\text{FV-P}}{\text{FV}}\right)\left(\frac{360}{t}\right)$$

$$=\%\text{discount}\times\left(\frac{360}{t}\right)$$

## Cash management

- **The money market yield is**

$$R_{mm}=\left(\frac{F-P}{P}\right)\left(\frac{360}{t}\right)=HPR\times\left(\frac{360}{t}\right)$$

- **The bond equivalent yield is**

$$BEY=\left(\frac{F-P}{P}\right)\left(\frac{365}{t}\right)=HPR\times\left(\frac{365}{t}\right)$$





## Short term funding

- Short term deficient in cash balance can be managed by the following ways:
  - **Sources of short-term funding from banks**
    - ✓ **Lines of credit:** for large corporations with limited reliability.
      - ◆Uncommitted line of credit: bank reserves the right to refuse to honor any request for use of the line.
      - ◆**Committed Line of credit:** bank charges a fee for making a commitment for short term lending, more reliable.
      - ◆A revolving line of credit: a commitment for longer term lending, more reliable than Committed term lending.
    - ✓ **Pledge assets as collateral for bank borrowings.**
    - ✓ **Banker's acceptances**: mainly used by firms that export goods, who get guarantee from the buyer's bank.
    - ✓ **Factoring**: sale A/R to bank.
  - **Non-Bank Sources of Short-term Funding**
    - ✓ **Non-bank finance company**: small weak borrowers with weak credits;
    - ✓ **Commercial paper**: Large corporations and the rate for short-term fund is lowest.





## Topic Weightings in CFA Level I

| Session NO. | Content | Weightings |
|---|---|---|
| Study Session 1 | Ethical and Professional Standards | 15 |
| Study Session 2-3 | Quantitative Methods | 12 |
| Study Session 4-5 | Economics | 10 |
| Study Session 6-9 | Financial Reporting and Analysis | 20 |
| Study Session 10-11 | Corporate Finance | 7 |
| Study Session 12 | Portfolio Management | 7 |
| **Study Session 13-14** | **Equity** | **10** |
| Study Session 15-16 | Fixed Income | 10 |
| Study Session 17 | Derivatives | 5 |
| Study Session 18 | Alternative Investments | 4 |

# Framework

## Equity Investments

- **Market Organization, Indices and Efficiency**
  - R45 Market Organization and Structure
  - R46 Security Market Indices
  - R47 Market Efficiency
- **Equity Analysis and Valuation**
  - R48 Overview of Equity Securities
  - R49 Introduction to Industry and company Analysis
  - R50 Equity Valuation: Concept and Basic Tool





# Reading 45

**Market Organization and Structure**





# Framework

1. Main Functions of the Financial Market
2. Intermediaries of Financial Market
3. Well functioned financial market **1406 (1)**
4. Classification of assets
5. Classification of markets
   - Primary vs. Secondary markets
   - Money vs. Capital markets
   - Traditional vs. Alternative markets
6. Positions in an asset
7. Instructions of transaction processes

## Characteristics of a financial market

| Main function of the financial market | |
|---|---|
| **First function:** fulfill different entities' requirements | Savings, borrowing, issuing equity, risk management, exchanging assets, utilizing information。 |
| **Second function:** discovery of the rates of return | The aggregate amount of money that savers will move from the present to the future is related to the expected rate of return on their investments. |
| **Third function:** capital allocation efficiency | Although companies may be interested in getting funding for many potential projects, not all projects are worth funding;<br>One of the most important functions of the financial system is to ensure that only the best projects obtain scarce capital fund. |





## Intermediaries of financial market

| Financial intermediaries | The services that they provide |
|---|---|
| **Brokers, dealers, and exchanges** | Help with the trade of securities. |
| **Securitizers** | Manage the process of buying assets, placing them in a pool, and then selling securities that represent ownership of the pool is called securitization. |
| **Depository institutions** | Absorb deposits by paying interest on customer deposits<br>Provide transaction services on one hand, and then make loans with the deposits on the other hand. |
| **Insurance companies** | Create insurance contracts (policies) that provide a payment in the event that some loss occurs;<br>The buyers benefit because they can easily obtain the risk transfers;<br>Moral hazard; adverse selection; fraud。 |





## Intermediaries of financial market

| Financial intermediaries | The services that they provide |
|---|---|
| **Arbitrageurs** | Seek to gain certain return without bearing any risk;<br>Buy and sell identical or essentially similar instruments at different prices in different markets. |
| **Clearinghouses and custodians** | Clearinghouses: arrange for final settlement of trades to limit the counterparty risk;<br>Custodians: hold securities on behalf of their clients to prevent the loss of securities through fraud, oversight, or natural disaster. |

## Classification of markets

| Classification of markets | |
|---|---|
| **Primary VS Secondary markets** | ✓ Primary market: the place for firms to publicly rise capital.<br>✓ IPO (initial public offerings): an issuer sells the security to the public for the first time.<br>✓ Seasoned offerings (secondary issues): a listed company issues new shares to the market. |
| **Money VS Capital markets** | ✓ Money markets: the market for short-term debt instruments (one-year maturity or less).<br>✓ Capital markets: financial markets that trade securities of longer duration, such as bonds and equities. |
| **Traditional VS Alternative markets** | ✓ Traditional investment markets: markets for traditional investments, include all publicly traded debts and equities.<br>✓ Alternative markets: market for investments other than traditional securities investments. |





## Classification of markets

➢ **How securities are sold through primary market**

| Security transaction methods | |
|---|---|
| **Sold Publicly** | ✓ Underwritten offering (the most common way);<br>✓ Best efforts;<br>✓ Indications of interest. |
| **Sold Privately** | ✓ Private placement. |
| **Other transaction methods** | ✓ Shelf registration;<br>✓ Dividend reinvestment plan;<br>✓ Rights offering;<br>✓ Competitive bids;<br>✓ Negotiated sales. |





## Classification of markets

➢ **How securities are sold through primary market- sold publicly**

- Difference between underwritten offering and best efforts

| Underwritten offering | Best Efforts |
|---|---|
| Guarantees the sale of the issue | Not obligated to buy the unsold portion |
| Investment banks have strong incentives to choose a low price that banks can allocate valuable shares to benefit their clients and thereby indirectly benefit the banks. | Investment bank generally are supposed to select the offering price that will raise the most money. |

## Classification of markets

| How securities are traded in Secondary Markets | |
|---|---|
| **Order-driven market** | ✓ Order-driven markets arrange trades using rules to match buy orders to sell orders<br>● Price priority: the highest priced buy orders and the lowest priced sell orders go first;<br>● Secondary precedence rule: use time precedence to rank orders at the same price. The first order to arrive has precedence over other orders. |
| **Quote-driven market** | ✓ A dealer market, a price-driven market or an over-the-counter market provide liquidity for investors by buying and selling the shares of stock for themselves;<br>✓ Numerous dealers compete against each other to provide the highest bid prices (lowest asking price) when investors are selling (buying). |
| **Brokered markets** | ✓ Brokers arrange trades among their clients. Trading assets are something infrequently traded and expensive to carry in inventory, including very large blocks of stock, real estate properties, fine art masterpieces. |





## Classification of markets

➢ **Secondary capital markets**

- How securities are traded in secondary markets
  - ✓ Comparison between quote-driven market and order-driven market.

| Quote-driven market | Order-driven market |
|---|---|
| Dealers make a market in the stock, which means that they are willing to buy or sell for their own account at a specified bid-and-ask price. | Enough buyers and sellers are trading to allow the market to be continuous. |





## Positions in an asset

➢ **Long position**

- People have long positions when they own assets or contracts;
- Benefit form an increase in the price.

➢ **Short position**

- People have short positions when they have sold assets that they do not own, or when they write and sell contracts.
- For a short-sale, the procedure is as below
  - ✓ Borrow securities from security lenders who are long holders. Then sell the borrowed securities to other traders;
  - ✓ Close their positions by repurchasing the securities and returning them to the security lenders;
  - ✓ Maintain the proceeds of short-sales as collateral.
- Benefit from a decrease in the price.
- The potential gains on a short position are limited to no more than 100 percent whereas the potential losses are unbounded.

## Positions in an asset

- **Leveraged positions**
  - **Definition:** traders buy securities by borrowing some of the purchase price.
  - **Buy on margin**: traders can buy securities by borrowing some of the purchase price. They usually borrow the money from their brokers.
    - ✓ The borrowed money is called the margin loan;
    - ✓ And they are said to buy on margin.
  - The interest rate that the buyers pay for their margin loan is called the call **money rate.**
  - **Leverage ratio**
    - ✓ The leverage ratio indicates how many times larger a position is than the equity that supports it.





## Positions in an asset

- **Leveraged positions**
  - Margin requirement: the required equity position is called the margin requirement.
    - ✓ **Initial margin**: a minimum amount of equity at the time of a new margin purchase;
    - ✓ **Maintenance margin**: is the investor's required equity position in the account;
    - ✓ **Margin call**: if an investor's margin account balance falls below the maintenance margin, the buyer will receive a margin call and will be required to either liquidate the position or bring the account back to its **maintenance (minimum) margin requirement.**





## Positions in an asset

- **Leveraged positions**
  - Computation of the price triggering a margin call
    - ✓ Margin call price for a **leverage position.**

$$P_L^{'} = P_0\left(\frac{1-IM}{1-MM}\right)$$

## Instructions of transaction processes

- **The highest bid in the market is the best bid, and the lowest ask in the market is the best offer**
  - **Make the market**: A buy/sell order placed at the best bid/offer;
  - **Take the market**: Those who trade with the people who placed order at posted prices are said to take the market;
  - **Behind the market**: A buy order placed below the best bid or a sell order placed above the best offer;
  - **Far from the market**: A behind the market order whose price is far from their best ask/offer;
  - **Marketable or aggressively priced:** A limit buy order above the best ask or a limit sell order below the best bid;

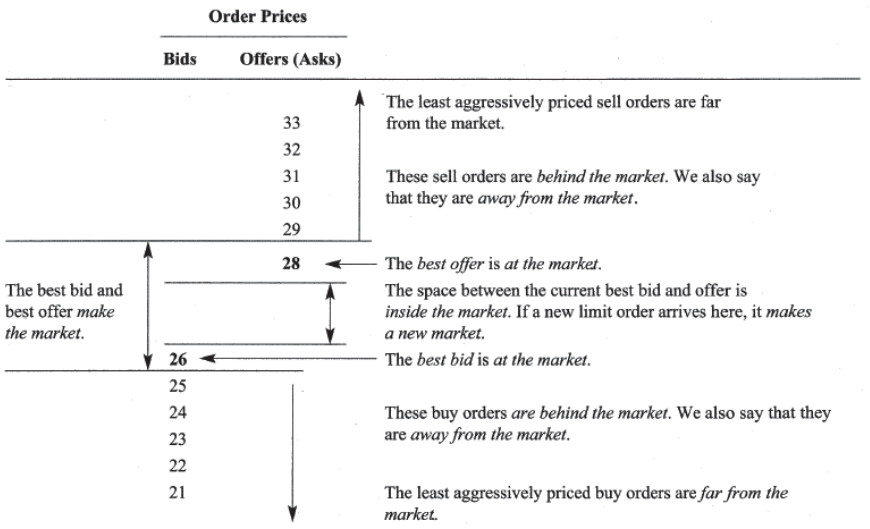






1506 (1)

## Instructions of transaction processes










1412 (1) 1606 (1) 1706 (1)
1512 (2)

## Instructions of transaction processes

| Compare execution, validity, and clearing instructions | Compare market orders with limit orders |
|---|---|
| **Execution instructions:** that specify how to trade | ✓ The most common orders<br>● Market orders;<br>● Limit order. Limit orders waiting to execute are called standing limit orders.<br>✓ Instructions concern the volume of the trade<br>● All-or-nothing orders.<br>✓ Instructions concern the visibility of the trade<br>● Hidden orders;<br>● Iceberg orders. |
| **Validity instructions:** that specify when the order can be filled | ✓ Day orders;<br>✓ Good-till-cancelled orders(GTC);<br>✓ Immediate or cancel orders;<br>✓ Good-on-close orders;<br>✓ Stop orders<br>● stop-sell order;<br>● stop-buy order. |
| **Clearing instructions:** that specify how to settle the trade | Usually not attached to an order. |

# Reading 46

## Security Market Indices





## Framework

1. Definitions about Market Indexes
2. How an index is constructed
3. Uses of Security-Market Indexes
4. Weighting schemes for stock indexes
   - Price-Weighted Index
   - Equal-Weighted Index
   - Market Capitalization-Weighted Index
   - A Float-Adjusted Market Capitalization-Weighted Index
   - Fundamental weighting
5. Rebalancing and Reconstitution
6. Other investment indexes





## Introduction of security market index

| **A security market index: is used to represent the performance of an asset class, security market, or segment of a market.** | |
|---|---|
| **Price index** | A price index reflects only the prices of the constituent securities within the index;<br>A price return measures only price appreciation or percentage change in price. |
| **Return index** | A total return index reflects not only the prices of the constituent securities but also the reinvestment of all income received since inception;<br>Total return measures price appreciation plus interest, dividends, and other distributions. |

## Methods of index construction

| Weighting schemes for stock indexes | |
|---|---|
| Price-weighted index | price-weighted index= $\frac{\text{sum of stock prices}}{\text{number of stocks in index adjusted for splits}}$ |
| Equal-weighted index | Arithmetic mean: $x_i$ is the return on each stock<br>change in average index value= $\frac{\sum x_i}{n}$<br>Geometric mean: $x_i=1+hpr_i$<br>change in average index value= $\sqrt[n]{x_1x_2\cdots x_n}-1$ |
| Market capitalization-weighted index | $\frac{\text{current total market value of index stocks}}{\text{base year total market value of index stocks}}\times$base year index value |
| A float-adjusted market capitalization-weighted index | The weight on each constituent security is determined by adjusting its market capitalization for the number of shares of the constituent security that are available to the investing public. |
| Fundamental weighting | Weighting by using measures of a company's size that are independent of its security price to determine the weight on each constituent security. (E.G. book value, revenue, etc.) |





## Rebalancing and reconstitution

- **Rebalancing and Reconstitution**
  - **Rebalancing**
    - ✓ To maintain the weight of each security consistent with the index's weighting method, the index provider rebalances the index by adjusting the weights of the constituent securities on a regularly scheduled basis, usually quarterly.
  - **Reconstitution**
    - ✓ Reconstitution is the process of changing the constituent securities in an index;
    - ✓ Constituent securities that no longer meet the criteria are replaced with securities that do meet the criteria.





## Characteristics of equity indexes

| Equity indexes | Fixed income indexes | Alternative investment indexes |
|---|---|---|
| • Broad market index<br>• Multi-market index<br>• Multi-market index with fundamental weighting<br>• Sector index<br>• Style index | Several issues with the construction of fixed income indexes<br>✓ Large universe of securities<br>✓ Dealer markets and infrequent trading | • Commodity indexes<br>• Real estate indexes<br>• Hedge fund indexes |

# Reading 47

## Market Efficiency

256-365





## Framework

1. What is Efficient Capital Market
2. Factors affect the degree of market efficiency
3. Three forms of market efficiency
   - The weak-form EMH
   - The semi-strong form EMH
   - The strong-form EMH
4. Tests, Implications and Conclusions of EMH
5. Market Anomalies
6. Behavior Finance

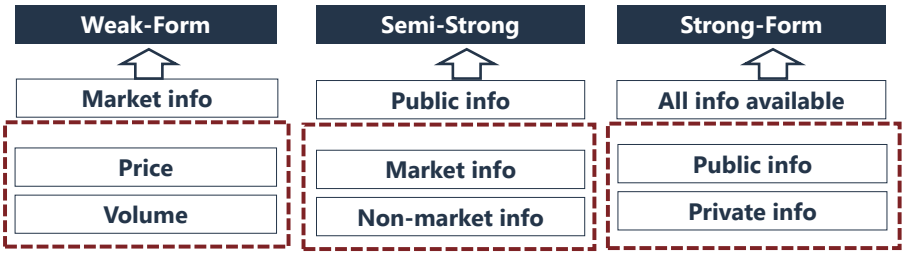
257-365





## Three forms of market efficiency

➢ **Three forms of market efficiency:**




| Types | Assumption | Implication |
|---|---|---|
| Weak-form EMH | Market info. | Technical analysis ✗ |
| Semi strong-form EMH | Public info. | Technical analysis ✗<br>Fundamental analysis ✗ |
| Strong-form EMH | All info. | Technical analysis ✗<br>Fundamental analysis ✗<br>Nobody can win the market ✗ |

258-365

## Tests, implications and conclusions of EMH

| | |
|---|---|
| Anomalies in time-series data | Calendar anomalies<br>Momentum anomalies |
| Anomalies in cross-sectional data | Size effect<br>Value effect |
| Other identified anomalies | Closed-end investment funds<br>Earnings announcements<br>Initial public offerings<br>Economic fundamentals |





## Behavioral finance

| Behavioral biases that have been identified include | |
|---|---|
| Loss aversion | Loss aversion refers to the tendency of people to dislike losses more than they like comparable gains. |
| Overconfidence bias | Overconfidence bias explains that investors or analysts are overconfident in their earning forecasts which result in the overestimation of growth, good news. |
| Representativeness | Investors assume good companies or good markets are good investments. |
| Gambler's fallacy | Recent results affect investor estimates of future probabilities. |
| Mental accounting | Investors classify different investments into separate mental accounts instead of viewing them as a total portfolio. |
| Conservatism | Investors react slowly to changes. |
| Disposition effect | Investors are willing to realize gains but unwilling to realize losses. |
| Narrow framing | Investors view events in isolation. |





# Reading 48

**Overview of Equity Securities**

# Framework

1. Classification of Public Equity Securities
2. Private Equity Securities
3. Non-domestic Equity Securities
4. Risk and Return Characteristics of Equity Securities





## Characteristics of equity securities

| Classification of equity securities | |
|---|---|
| Common shares | Represent an ownership interest in a company and are the predominant type of equity security. |
| Callable common shares | Give the issuing company the option (or right), but not the obligation, to buy back shares from investors at a call price that is specified when the shares are originally issued. |
| Putable common shares | Give investors the option or right to sell their shares (i.e., "put" them) back to the issuing company at a price that is specified when the shares are originally issued. |





## Characteristics of equity securities

| Classification of equity securities | |
|---|---|
| Preference shares | A type of equity interest which ranks above common shares with respect to the payment of dividends and the distribution of the company's net assets upon liquidation. |
| Cumulative preference shares | If the company decides not to pay a dividend in one or more periods, the unpaid dividends accrue and must be paid in full before dividends on common shares can be paid. |
| Participating preference | Entitle shareholders to receive an additional dividend if the company's profits exceeds a pre-specified level. |
| Convertible preference shares | Convertible preference shares entitle shareholders to convert their shares into a specified number of common shares. |

## Risk and return of equity securities

- **The risk is most commonly measured as the standard deviation of returns (收益的标准差).**

**Low ← risk → High**

Putable stock <Preferred stock <Common stock <Callable stock

Cumulative preferred stock <Non-cumulative preferred stock





## Non-domestic equity securities

| Non-domestic equity securities | |
|---|---|
| Direct investing | Is to buy and sell securities directly in foreign markets. |
| Global registered shares(GRS) | Are common shares that are traded on different stock exchanges around the world in different currencies. |
| Basket of listed depository receipts ( BLDR ) | Are exchange-traded fund (ETF) that represent a portfolio of depository receipts (DRs). |
| Depository receipts ( DRs ) | Are securities that trade like ordinary shares on a local exchange and represent economic interests in foreign companies.<br>• Sponsored DR;<br>• Unsponsored DR;<br>• Global depository receipts (GDRS);<br>• American depository receipts (ADRS). |





# Reading 49

**Introduction to Industry and company Analysis**

# Framework

1. Top-down process **1612 (1)**
2. General Economic Influence
3. Industry Influences
   - Industry Life Cycle
   - Business Cycle
   - Statistical methods
4. Company analysis
   - Competitive strategies





## Industry influences

| Classification by their sensitivity to business cycles | |
|---|---|
| **Embryonic stage** | Growth is slow; high prices; substantial investment is required; failure risk. |
| **Growth stage** | Rapidly increasing demand; limited competitive pressures; falling prices; increasing profitability. |
| **Shakeout stage** | Slowing growth; intense competition; increasing industry overcapacity; declining profitability; increased cost cutting; increased failures. |
| **Mature stage** | Little or no growth; consolidation; high barriers to entry; stable pricing; companies with superior products or services are likely to gain market share. |
| **Decline stage** | Growth turns negative; declining demand and prices; consolidation. |





## Industry influences

- **Factors that affect the sensitivity of business cycle**
  - **Cyclical firm:** a cyclical firm is one whose profits are strongly correlated with the strength of the overall economy.
    - ✓ **High earnings volatility**
    - ✓ **High operating leverage**
    - ✓ Such as: autos, energy, financial services, housing, basic materials, industrials, durables and technology.
  - **Non-cyclical firm:** A non-cyclical company is one whose performance is largely independent of the business cycle.
    - ✓ **Examples include:** staple consumer goods(food and beverage), household and personal care products, health care, and utilities;
    - ✓ **Defensive industries:** revenues and profits are least affected by fluctuations in overall economic activity;
    - ✓ **Growth industries:** would include industries with specific demand dynamics that are so strong that they override the significance of broad economic or other external factors.

# Industry influences

- **Industry classification system (cont.)**
  - Classification by statistical methods
    - ✓ Statistical approaches to grouping companies are typically based on the correlations of past securities' returns.
    - ✓ For example, using the technique known as cluster analysis.
    - ✓ This method has several **limitations**
      - ◆This method of aggregation often results in non-intuitive groups of companies;
      - ◆The composition of the groups may vary significantly by time period and region of the world;
      - ◆The statistical approaches rely on historical data, which have not guaranteed that past correlation values will continue in the future;
      - ◆Falsely indicating a relationship that arose because of chance;
      - ◆Falsely excluding a relationship that actually is significant.





# Industry influences

- **Pricing power**
  - **Barriers to entry**
    - ✓ low barriers to entry->little pricing power;
    - ✓ high barriers to entry do not necessarily mean high pricing power;
    - ✓ Low barriers to exit may have higher pricing power (Overcapacity).
  - **Industry concentration**
    - ✓ It is not necessarily indicates that concentrated industries always have pricing power.
  - **Industry capacity**
    - ✓ Undercapacity->higher pricing power and higher return on capital
    - ✓ Overcapacity->lower pricing power and lower return on capital
  - **Market share stability**
    - ✓ Stable market shares typically indicate less competitive industries.





# Industry influences

- **Competitive Advantage**
- Analysis of the competitive environment with an emphasis on the implications of the environment for corporate strategy is known as strategic analysis. Michael porter's "five forces" framework is a classic starting point.
  - **Rivalry among existing competitors:** which is a function of the industry's competitive structure;
  - **Threat of entry:** which depends on barriers to entry, or how difficult it would be for new competitors to enter the industry;
  - **Power of suppliers:** which may be able to raise prices or restrict the supply of key inputs to a company;
  - **Power of buyers:** which can affect the intensity of competition by exerting influence on suppliers regarding prices;
  - **Threat of substitutes:** which can negatively affect demand if customers choose other ways of satisfying their needs.

## Company analysis

- **Three generic competitive strategies**
  - **Cost leadership:** with the same product, the firm seeks to a lower cost;
  - **Differentiation:** with the same cost, the firm seeks to provide product benefits that other firms do no provide;
  - **Focus:** the firm targets a niche with either a cost or a differentiation focus.

| Low-cost strategy | Product differentiation strategy |
|---|---|
| • Strive to become the low-cost producers;<br>• Pricing may become predatory—driving competitors out of business;<br>• Tight cost controls, efficient operating and reporting systems, and appropriate managerial incentives. | • Attempt to provide products and services that are unique;<br>• The price premiums must be above their costs of differentiation and the differentiation must be appealing to customers and sustainable over time;<br>• Strong market research teams to identify and match customer needs. |





# Reading 50

**Equity Valuation: Concept and Basic Tool**





## Framework

1. Evaluate a security
2. Major categories of equity valuation models
   - Discounted cash flow models
   - Multiplier models
   - Asset-based models

# Discounted cash flow models

- **Valuing preferred stock**
  - The preferred stock holders are promised to receive a stated dividend for an infinite period;
  - Preferred stock is perpetuity since it has no maturity;
  - Valuation model of a preferred stock

$$V_p = \frac{D_p}{(1+r_p)} + \frac{D_p}{(1+r_p)^2} + \cdots + \frac{D_p}{(1+r_p)^N} = \frac{D_p}{r_p}$$





# Discounted cash flow models

- **Valuing common stock –dividend discount model (DDM)**
  - **Gordon growth model (constant growth model)**
    - ✓ **Assumption** for the infinite period DDM
      - ◆Dividends grow at a constant rate;
      - ◆The constant growth rate will continue for an infinite period;
      - ◆The required rate of return *r* is greater than the infinite growth rate *g*. If it is not, the model gives meaningless results.

$$V_0 = \frac{D_0(1+g_c)}{(1+r_e)} + \frac{D_0(1+g_c)^2}{(1+r_e)^2} + \cdots + \frac{D_0(1+g_c)^\infty}{(1+r_e)^\infty}$$

$$V_0 = \frac{D_0(1+g_c)}{r_e - g_c} = \frac{D_1}{r_e - g_c}$$



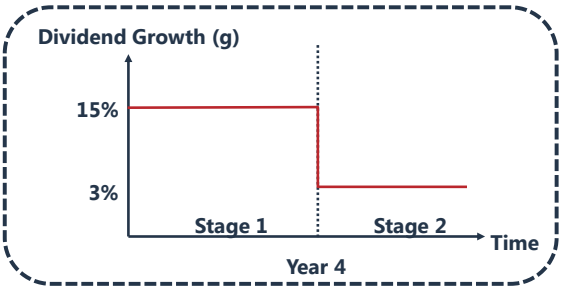


# Discounted cash flow models

- **Valuing Common Stock –Dividend discount Model (DDM)**
  - **Gordon growth model (Constant growth model)**
    - ✓ **Limitations**
      - ◆Very sensitive to estimates of r and g;
      - ◆Difficult with non-dividend stocks;
      - ◆Difficult with unpredictable growth patterns (use multi-stage model).
    - ✓ **Important conclusion**
      - ◆The wider is the difference between r and g, the smaller the value of the stocks;
      - ◆Small changes in the difference between r and g will cause large changes in the stocks' value.

# Discounted cash flow models

- **Valuing common stock –dividend discount model (DDM)**
  - **Two-stage DDM**
    - ✓ The growth rate starts at a high level for a relatively short period of time, then reverts to a long-run perpetual level.








# Price multiple approach

- **Multiples based on comparable**
  - The methodology involves using a price multiple to evaluate whether an asset is fairly valued, undervalued, or overvalued in relation to a benchmark value of the multiple.
  - **Law of one price:** two identical assets should sell at the same price
    - ✓ **Comparable**
      - ◆ Multiples may not be comparable across firms if the firms are different sizes, are in different industries, or with grow at different rates.
    - ✓ **Disadvantages of using price multiples**
      - ◆ Conclusion drawn under the comparable and fundamental method may be reverse;
      - ◆ (Price multiples may lose validity when firms use different accounting methods;
      - ◆ Price multiples for cyclical firms may be highly influenced by current economic conditions.





# Price multiple approach

- **Multiples based on fundamentals**
  - The earnings multiplier model derived from DDM
    - ✓ According to infinite period DDM

$$P_0 = \frac{D_1}{r\text{-}g}$$

    - ✓ **Justified P/E:** assume we divide both sides of the equation by $E_1$ (expected 12-month earnings), the equation changes to
      - ◆**Leading P/E:** based on expected earnings next period

$$\frac{P_0}{E_1} = \frac{D_1/E_1}{r\text{-}g} = \frac{1\text{-}b}{r\text{-}g}$$

      - ◆**Trailing P/E:** based on actual earnings for the previous period

$$\frac{P_0}{E_0} = \frac{D_0/E_0}{r\text{-}g}(1+g) = \frac{(1\text{-}b)(1+g)}{r\text{-}g}$$

## Price multiple approach

- **Enterprise value (cost to acquire the firm)**
  - Enterprise value (EV) is total company value, not equity;
  - EV = market value of common stock + market value of preferred equity + market value of debt– cash and short-term investments.
- **Advantage**
  - Useful for comparing firms with different degrees of financial leverage;
  - EBITDA is useful for valuing capital-intensive business EB;
  - EBITDA is usually positive even when EPS is not.
- **Disadvantages**
  - Market value of debt is often not available.
    - ✓ Bond values may be estimated from current quotations for bonds with similar maturity, sector, and credit characteristics;
    - ✓ Substituting the book value of debt for the market value of debt provides only a rough estimate of the debt's market value.





## Asset-based valuation

- **An asset-based valuation** of a company uses estimates of the market or fair value of the company's assets and liabilities;
- **The asset-based model** is **not** really applicable for a firm with a high proportion of intangible assets or "off the books" assets.
- **The asset-based valuation approach is most applicable when**
  - The market value of the corporate assets is readily determinable;
  - The intangible assets, which are typically difficult to value, are a relatively small proportion of corporate assets;
  - Financial companies, natural resource companies, and formerly going-concerns that are being liquidated.
- **Asset-based models are frequently used for valuation of private companies.**





## Topic Weightings in CFA Level I

| Session NO. | Content | Weightings |
|---|---|---|
| Study Session 1 | Ethics & Professional Standards | 15 |
| Study Session 2-3 | Quantitative Analysis | 12 |
| Study Session 4-5 | Economics | 10 |
| Study Session 6-9 | Financial Reporting and Analysis | 20 |
| Study Session 10-11 | Corporate Finance | 7 |
| Study Session 12 | Portfolio Management and Wealth Planning | 7 |
| Study Session 13-14 | Equity Investment | 10 |
| Study Session 15-16 | Fixed Income | 10 |
| **Study Session 17** | **Derivatives** | **5** |
| Study Session 18 | Alternative Investments | 4 |

## Framework

- **Derivative Concept (R57)**
  - Forward → Futures → Swap
  - Option
- **Derivative Pricing And Valuation（R58）**
  - Arbitrage-Free Pricing → Forward、Futures & Swap
  - Binomial Valuation → Option
- **Risk Management（R59）**
  - Covered call
  - Protective put





## Framework for R57

| | |
|---|---|
| **Forward contract** | ➢ Is an agreement that obligates one party to buy and the other party to sell a specific quantity of an underlying asset, at a set price, at a future date<br>● If the future price of the underlying assets increase, the buyer has a gain, and the seller has a loss. |
| **Futures contract** | ➢ Is a specialized version of a forward contract that has been standardized and that trades on a futures exchange.<br>● A forward contract<br>● Are regulated<br>● Guarantee provided by the exchange through the clearinghouse<br>● the daily settlement for gains and losses. |

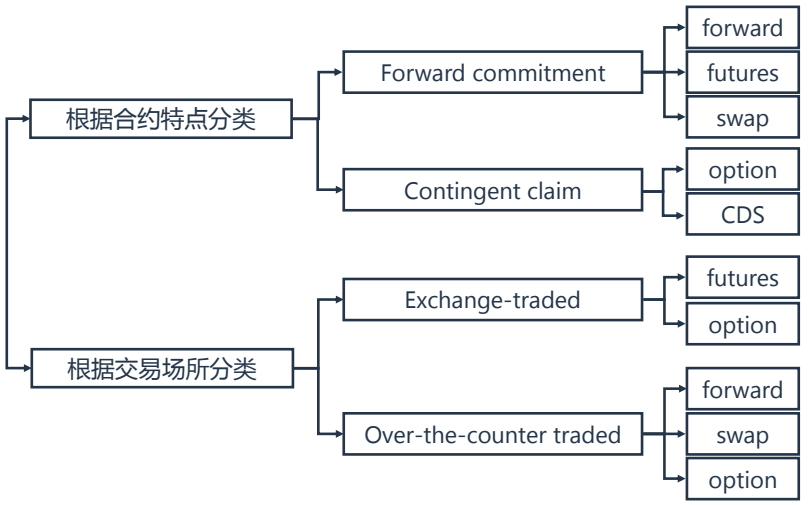




## Framework for R57

| | |
|---|---|
| **Swap contract** | ➢ A series of forward contracts<br>● Forward contracts;<br>● Exchange a series of cash flows. |
| **Option contract** | ➢ The owner has the right, but not the obligation to conduct the transaction.<br>➢ Right and obligations are not equal only in option contract, so the long position need to pay option premium. |

## Derivative Markets and Instruments








## Derivative Markets and Instruments

- **Advantage**
  - Price discovery;
  - Risk management: hedge and speculation;
  - Lowering transaction costs;
  - Low capital requirement;
  - Greater liquidity;
  - Ease of going short;
  - Enhance market efficiency.
- **Disadvantage**
  - Too risky → High leverage;
  - Complex instruments;
  - Sometimes likened to gambling.
- **Key point**
  - Always increase risk? →No.





## Example

- Which of the following is least likely to be a purpose served by derivative markets?

  A. Arbitrage.

  B. Price discovery.

  C. Risk management.

- **Correct Answer: A.**

## Example

- The most likely reason derivative markets have flourished is that:
  - A. Derivatives are easy to understand and use.
  - B. Derivatives have relatively low transaction costs.
  - C. The pricing of derivatives is relatively straightforward.

- **Correct Answer: B.**





## Derivative Markets and Instruments

- **Basic Concept**

| | |
|---|---|
| **Definition** | ➢ A forward contract is a bilateral contract that obligates one party to buy and the other party to sell a specific quantity of an underlying asset, at a set price, on a specific date in the future. |
| **Types of forward contracts** | ➢ Commodity forward contract.<br>➢ Financial forward contract. |
| **Purposes of trading forward contracts** | ➢ **Hedge risk:** Lock the cost in the future, but not sure to make money; Have default risk.<br>➢ **Speculation：** gambling the price movement. |
| **Characteristics of Forward contracts** | ➢ Each party are exposed to **default risk** ( or counterparty risk).<br>➢ **Zero-sum game.** |



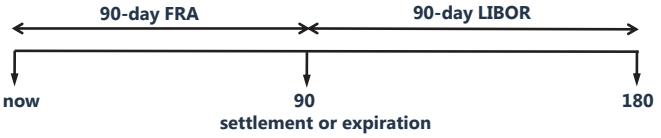


## Derivative Markets and Instruments

| | **Settlement** |
|---|---|
| **At expiration** | ➢ **Physical settlement**: deliver an actual asset，has storage cost, mostly used in commodity forward.<br>➢ **Cash settlement**: the party that has a position with negative value is obligated to pay that amount to the other party，mostly used in financial forward. |
| **Prior to expiration** | ➢ Entering into an **opposite forward contract**: with an expiration date equal to the time remaining on the original contract<br>● Offsetting with a different party: some credit risk remains<br>● Offsetting with the original party: can avoid credit risk |

# Derivative Markets and Instruments—Forward

- **LIBOR, Euribor, and FRAs**
  - Eurodollar time deposit;
  - London Interbank Offer Rate (LIBOR);
  - Euribor is a similar rate for borrowing and lending in Euros;
  - A forward rate agreement (FRA) is a forward contract on an interest rate (LIBOR).
- **Definition of FRA：An FRA can be viewed as a forward contract to borrow/lend money at a certain rate at some future date.**
  - **The long position**: is the party that would **borrow** the money
  - **The short position**: is the party that would **lend** the money
  - **Quotation**： Example: 3×6 FRA








# Derivative Markets and Instruments—Forward

- **LIBOR, Euribor, and FRAs ( Con't )**
  - **Attention to the "Payoff" Calculation**
    - ✓ If the rate given is on an annual basis, it should be converted into a monthly-based rate.
    - ✓ The difference in rates is multiplied by the notional amount of the contract.
    - ✓ The payment at settlement is the present value of the interest difference, discounted at the rate prevailing at settlement.
  - The general formula for the payment to the long at settlement is:

$$(\text{notional principal})\left[\frac{(\text{floating rate at settlement}-\text{forward rate})\left[\frac{\text{days}}{360}\right]}{1+\text{floating rate at settlement}\left[\frac{\text{days}}{360}\right]}\right]$$





# Derivative Markets and Instruments—Futures

- **Difference with forward**

| Forwards | Futures |
|---|---|
| Private contracts | Exchange-traded |
| Unique customized contracts | Standardized contracts |
| Little or no regulation | Regulated |
| Default risk is present | Guaranteed by clearinghouse |
| Settlement at maturity | Daily settlement (mark to market) |
| No margin deposit required | Margin required and adjusted |

# Derivative Markets and Instruments—Futures

- **Risk control of Futures contract**
  - **Method 1: Margin**
    - ✓ **Initial margin**: The first deposit is called the initial margin. Initial margin must be posted before any trading takes place;
    - ✓ **Maintenance margin**: is the amount of money that each participant must maintain in the account after the trade is initiated. If the margin balance is **lower than the maintenance margin**, the trader will get a margin call.
    - ✓ **Variation margin**: used to bring the margin balance back up to the **initial margin level.**





# Derivative Markets and Instruments—Futures

- **Risk control of Futures contract (Con't)**
  - **Margin (Con't):** difference between equity margin

| | Futures margin | Equity margin |
|---|---|---|
| Purpose | As pledge, control default risk | Borrow capital, has leverage |
| Cash flow direction | Outflow | Inflow |
| Interest paid | No interest paid | Loan, interest paid needed |
| Replenish margin | Back to initial margin | Back to maintenance margin |

  - **Method 2: Daily price limit**
  - **Method 3: Daily settlement**





# Derivative Markets and Instruments—Swap

- **Interest Rate Swaps**
  - The **plain vanilla interest rate swap** involves trading fixed interest rate payments for floating-rate payment ( paying fixed and receiving floating ).
    - ✓ **Counterparties**: The parties involved in any swap agreement are called the counterparties
    - ✓ **Pay-fixed side**: The counterparty that makes fixed-rate interest payment in exchange for variable interest rate.
    - ✓ **Pay-floating side**: The counterparty that makes variable-rate interest payment in exchange for fixed payment.

# Derivative Markets and Instruments—Option

- **Basic Concepts**
  - **Definition of option:** An option gives its owner the right, but not the obligation, to buy or sell an underlying asset on or before a future date (the expiration date) at a predetermined price (the exercise price or strike price)
    - ✓ **Call option:** Long call & Short call
    - ✓ **Put option:** Long put & short put
    - ✓ The seller or short position in an options contract is sometimes referred to as the **writer of the option**
  - **Prices**
    - ✓ **Option premium:** option premium paid by the buyer of option;
    - ✓ **Exercise price:** strike price (X) represents the exercise price specified in the contract.





# Derivative Markets and Instruments—Option

- **Moneyness: on the long position**
  - **Moneyness：**
    - ✓ **In the money**: Immediate exercise would generate a positive payoff
    - ✓ **At the money**: Immediate exercise would generate no payoff
    - ✓ **Out of the money**: Immediate exercise would generate a negative payoff.
  - The following table summarizes the moneyness of options based on the stock's current price, S, and the option's exercise strike price, X.

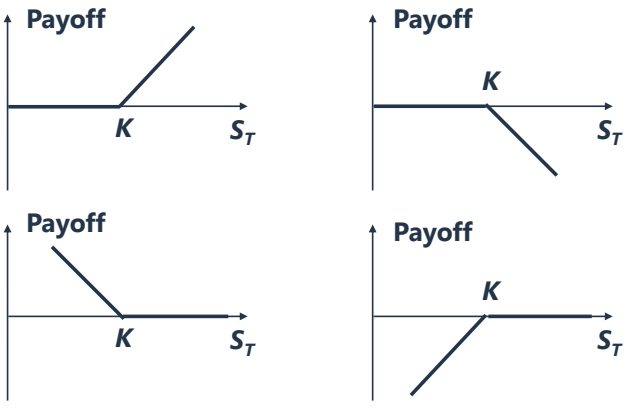
| Moneyness | Call option | Put Option |
|---|---|---|
| In-the-money | S＞X | S＜X |
| At-the-money | S = X | S = X |
| Out-the-money | S＜X | S＞X |





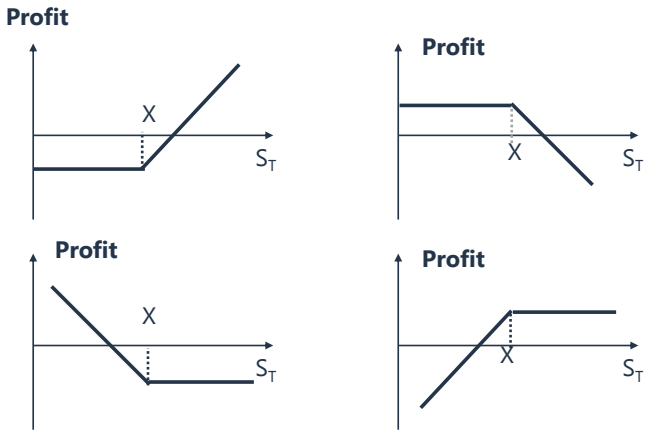
# Derivative Markets and Instruments—Option

- **Payoff**



## Derivative Markets and Instruments—Option

➢ **Gain/Loss**








## Derivative Markets and Instruments—Option

➢ **Intrinsic Value: on the long position**

- **Intrinsic Value:** the amount that it is in the money, and zero otherwise
  - ✓ Intrinsic value of call option: C=max[0, S-X]
  - ✓ Intrinsic value of put option: P=max[0, X-S]
- **Time Value:**
  - ✓ The difference between the price of an option (called its premium) and its intrinsic value is due to its time value
  - ✓ Option value=intrinsic value + time value
    - ◆Before expiration: option value>intrinsic value
    - ◆At expiration: option value=intrinsic value
- Price of the option is **more volatile** than prices of underlying stock





## Example

➢ An investor purchases an equity call option priced at CHF3 with an exercise price of CHF41. If at expiration of the option, the underlying is priced at CHF38, the profit for the investor's position is closest to:

A. –CHF6.
B. CHF0.
C. –CHF3.

➢ **Correct Answer: C.**

The option expires worthless, and the loss is equal to the premium paid.

# Derivative Markets and Instruments—Option

- **Put call parity**
  - Put call parity $c + X/(1+R_f)^T = S + p$

    或$c + K/(1+R_f)^T = S + p$
  - Positions replicating
    - ✓ Condition A $-s = -c + p - X/(1+R_f)^T$
    - ✓ Condition B $p = c + X/(1+R_f)^T - S$
    - ✓ Condition C $c = p + S - X/(1+R_f)^T$
    - ✓ Condition D $-p = -c + S - X/(1+R_f)^T$
    - ✓ Condition E $-c = -p + X/(1+R_f)^T - S$





# Put – call – forward parity

- **The first portfolio (Fiduciary call) consist of:**
  - A call option on the underlying with an exercise price of X
  - A pure-discount bond that pays X at time T.

  The cost of this portfolio is : $C_0 + \frac{X}{(1+R_f)^T}$
- **The second portfolio (Protective Put with a forward contract ) can be constructed by combining.**
  - A put option on the underlying with an exercise price of X
  - A pure-discount bond that pays X at time FP.
  - A forward contract that is agreed to buy the underlying at FP at time T.

  The cost of this portfolio is : $p_0 + \frac{FP}{(1+R_f)^T} + 0$
- **The payoff of the first portfolio at Time T is identical to that of the second portfolio. Then the cost of both portfolios must be equal.**

$$C_0 + \frac{X-F_T}{(1+R_f)^T} = p_0$$





# Example

- Combining a protective put with a forward contract generates equivalent out-comes at expiration to those of a:
  A. Fiduciary call.
  B. Long call combined with a short asset.
  C. Forward contract combined with a risk-free bond.
- **Correct Answer：A.**

## Example

- Based on put-call parity, a trader who combines a long asset, a long put, and a short call will create a synthetic:
  A. Long bond.
  B. Fiduciary call.
  C. Protective put.

- **Correct Answer：A.**





## Derivative Markets and Instruments—Option

- **Minimum and Maximum Option Values（公式）**
- **Min value and Max value of options without dividend**

| Option | Min Value | Max Value |
|---|---|---|
| European call | $\text{Max}[0, S_t - X/(1+R_f)^{T-t}]$ | $S_t$ |
| American call | $\text{Max}[0, S_t - X/(1+R_f)^{T-t}]$ | $S_t$ |
| European put | $\text{Max}[0, X/(1+R_f)^{T-t} - S_t]$ | $X/(1+R_f)^{T-t}$ |
| American put | $\text{Max}[0, X - S_t]$ | X |





## Derivative Markets and Instruments—Option

- **Early Exercise of American Options**
  - **American call options**
    - ✓ When the underlying makes no cash payments, no reason to exercise the call early, $C_0 = c_0$,
    - ✓ When the underlying makes cash payments during the life of the option, early exercise can happen, $C_0 >= c_0$
  - **American put options**
    - ✓ $P_0 > p_0$ , nearly always true,
      as long as there is a possibility of bankruptcy, $P_0$ always $> p_0$
      (consider an American put on a bankrupt company, stock →0, cannot go any lower, then put option holder may exercise it )

# Framework

1. Arbitrage, replication, and risk neutrality
2. Forward Markets and Contracts
   - Price and Value
3. Futures Contracts & forward contracts
4. Swap Markets and Contracts
5. Option Markets and Contracts
   - Binomial Model





## Basics of Derivative Pricing and Valuation

- **The price is the predetermined price in the contract that the long should pay to the short to buy the underlying asset at the settlement date**
- **The contract value is zero to both parties at initiation**
- **The no-arbitrage principle: there should not be a riskless profit to be gained by a combination of a forward contract position with position in other asset.**
  - Two assets or portfolios with identical future cash flows, regardless of future events, should have same price——**Law of one price.**
- **Risk neutrality**
  - Risk-neutral investors are willing to buy risky investments for which they expect to earn only the risk-free rate. They do not expect to earn a premium for bearing risk.
  - The expected payoff of the derivative can be discounted at the risk-free rate. And should yield the **risk-free rate of return**, if it generates certain payoffs





## Pricing and Valuation

- **Pricing a forward contract** is the process of determining the no-arbitrage price that will make the value of the contract be zero to both sides at the initiation of the contract.
  - Forward Price= price that would not permit profitable riskless arbitrage in frictionless markets
  - FP=$S_0$+Carrying Costs-Carrying Benefits
- **Valuation of a forward contract** means determining the value of the contract to the long (or the short) at some time during the life of the contract.

## Pricing and Valuation

- **T-bill (zero-coupon bond) forwards**
  - Buy a T-bill today at the spot price($S_0$) and short a T-month T-bill forward contract at the forward price(FP)
  - $FP=S_0\times(1+R_f)^T$
- **Forward value** of long position at initiation, during the contract life, and at expiration

| Time | Forward Contract Valuation |
|---|---|
| t=0 | Zero, because the contract is priced to prevent arbitrage |
| t=t | $V_{long}=S_t-\frac{FP}{(1+R_f)^{T-t}}$ $V_{short}=-V_{long}=\frac{FP}{(1+R_f)^{T-t}}-S_t$ |
| t=T | $S_T$-FP |





## Pricing and Valuation with cost and benefit

- **Forward contracts on a dividend-paying stock**
  - **Price:** $FP=(S_0-PVD_0)\times(1+R_f)^T$
  - **Value:** $V_{long}=S_t-PVD_t-\frac{FP}{(1+R_f)^{T-t}}$





## Forward Contracts on Coupon Bonds

- **Coupon bonds**
  - Similar to dividend-paying stocks, but the cash flow are coupons.
  - Price： $FP=(S_0-PVC_0)\times(1+R_f)^T$
  - Value：$V_{long}=(S_t-PVC_t)-\frac{FP}{(1+R_f)^{T-t}}$
- **General equations**
  - $FP=(S_0\text{-}PCB_0+PVC_0)\times(1+R_f)^T$
  - $FP=S_0(1+R_f)^T\text{-}(PVB_0\text{-}PVC_0)\ (1+R_f)^T$

## Pricing and Valuation with cost and benefit

- **Carry Costs, Costs of Storage, θ**
  - One cost incurred in owning commodity. E.g. corn, live cattle, and gold.
- **Carry Benefits, γ**
  - Monetary benefits: dividends, coupons, interest, etc.
  - Non-monetary benefits: convenience yield.
  - Convenience yield are primarily associated with commodities and generally exist as a result of difficulty in either shorting the commodity or unusually tight supplies.
  - $FP=(S_0 - \gamma + \theta) \times(1 + R_f)^T$ or $FP=(1 + R_f)^T - (\gamma - \theta)(1 + Rf)^T$
  - The net cost and benefit is often referred to by the term carry, or sometimes cost of carry. (Benefit-cost, γ - θ)





## Example

- Which of the following factors does not affect the forward price
  A. The costs of holding the underlying
  B. Dividends or interest paid by the underlying
  C. Whether the investor is risk averse, risk seeking, or risk neutral

- **Correct answer: C.**





## Example

- Which of the following factors does not affect the spot price of an asset that has no interim costs or benefits?
  A. The time value of money
  B. The risk aversion of investors
  C. The price recently paid by other investors

- **Correct answer: C.**

## Futures Pricing and Valuation

- **Prices of Futures vs. Forward Contracts**

| If the correlation between the underlying asset value and interest rate is... | Investors will... |
|---|---|
| **Positive** | Prefer to go long in a futures contract, and the futures price will be greater than the price of an otherwise comparable forward contract. |
| **Zero** | Have no preference. |
| **Negative** | Prefer to go long in a forward contract, and the forward price will be greater than the price of an otherwise comparable futures contract. |





## Swap Pricing and Valuation

- A swap contract is an agreement between two parties to exchange a series of future cash flows. There are three kinds of swaps: interest rate swaps, currency swaps and equity swaps.
- A plain vanilla swap is an interest rate swap in which one party pays a fixed rate and the other pays a floating rate. The terms of the long and short are not used here, instead we say the fixed-rate payer and floating-rate (variable-rate) payer.
- The price is just the fixed rate (called the swap rate) that makes the contract value zero to both parties at initiation. After some days the market situation changes, one party will make money and the other lose money. The contract value is no longer zero to both parties.



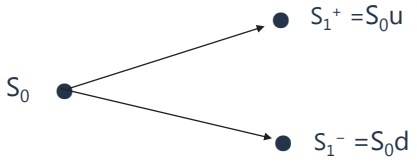


## Swap Pricing and Valuation

- **Equivalence of swaps to bonds:**
  - An interest rate swap is identical to issuing a fixed-rate bond and using the proceeds to buy a floating-rate bond.
- **Equivalence of swaps to forward contracts (FRA):**
  - A forward contract is an agreement to exchange future cash flows once, so a swap can be viewed as a series of forward contracts.
  - An interest rate swap, currency swap and equity swap are identical to a series of FRAs, currency forwards and equity forwards, respectively.
  - There are, however, some differences between swaps and forwards.

## Option Pricing and Valuation

- A **binomial model:** for pricing options in which the underlying price can move to only one of two possible new prices.
  - We start off by having only one binomial period, which means that the underlying price moves to two new prices at option expiration. We let $S_0$ be the price of the underlying stock now. One period later, the stock price can move up to $S_1^+$ or down to $S_1^-$. We then identify a factor, u, as the up move on the stock and d as the down move. Thus, $S_1^+ = S_0u$ and $S_1^- = S_0d$. We further assume that u = 1/d.








## Option Pricing and Valuation

- Risk-neutral probability of an up move is $\pi_u$ ; Risk-neutral probability of a down move is $\pi_d$=1- $\pi_u$;

$$\pi_u = \frac{1 + R_f - d}{u - d}$$

- We start with a call option. If the stock goes up to $S_1^+$ , the call option will be worth $C_1^+$. If the stock goes down to $S_1^-$, the call option will be worth $C_1^-$. We know that the value of a call option will be its intrinsic value on expiration date. Thus we get: $C_1^+$ = Max (0, $S_1^+ - X$) ; $C_1^-$ = Max (0, $S_1^- - X$)

$$\text{value of an option: } c = \left[\pi_u C_1^+ + \pi_d C_1^-\right] \times \frac{1}{(1+R_f)^T}$$

- **Hedge ratio:**

$$\text{Delta} = \frac{C^+ - C^-}{S^+ - S^-}(\textit{shares per option})$$





## Example

- Which of the following *best* describes the binomial option pricing formula?
  - A. The expected payoff is discounted at the risk-free rate plus a risk premium.
  - B. The spot price is compounded at the risk-free rate minus the volatility premium.
  - C. The expected payoff based on risk-neutral probabilities is discounted at the risk-free rate.
- **Correct answer: C.**

## Option Pricing and Valuation

- **Factors affect the value of an option**

| Sensitivity Factor | Calls | Puts |
|---|---|---|
| Underlying price | Positively related | Negatively related |
| Volatility | Positively related | Positively related |
| Risk-free rate | Positively related | Negatively related |
| Time to expiration | Positively related | Positively related* |
| Strike price | Negatively related | Positively related |
| Payments on the underlying | Negatively related | Positively related |
| Carrying cost | Positively related | Negatively related |

- There is an **exception** to the general rule that European put option thetas are negative. The put value may increases as the option approaches maturity if the option is deep in-the-money and close to maturity.





## Example

- Marla Johnson priced both a put and a call on Alpha Numero using standard option pricing software. To use the program, Johnson entered the strike price of the options, the price of the underlying asset, an estimate of the risk-free rate, the time to expiration of the option, and an estimate of the volatility of the returns of the underlying asset into her computer. Both prices calculated by the software program were substantially above the actual market values observed in that day's exchange trading. Which of the following is the most likely explanation? The value Johnson entered into the program for the:
  A. estimate of volatility was too low.
  B. estimate of volatility was too high.
  C. Time to expiration of the options was too low.

- **Correct Answer: B.**





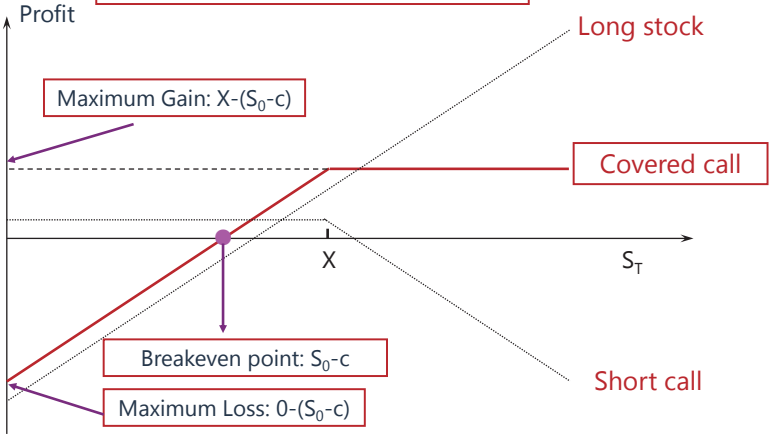
## Framework

1. Covered call
2. Protective put

# Risk management applications

- **Covered Call**

$$\text{Covered Call} = -c+S = -p+\frac{X}{(1+r_f)^{T-t}}$$








# RM applications of option strategies

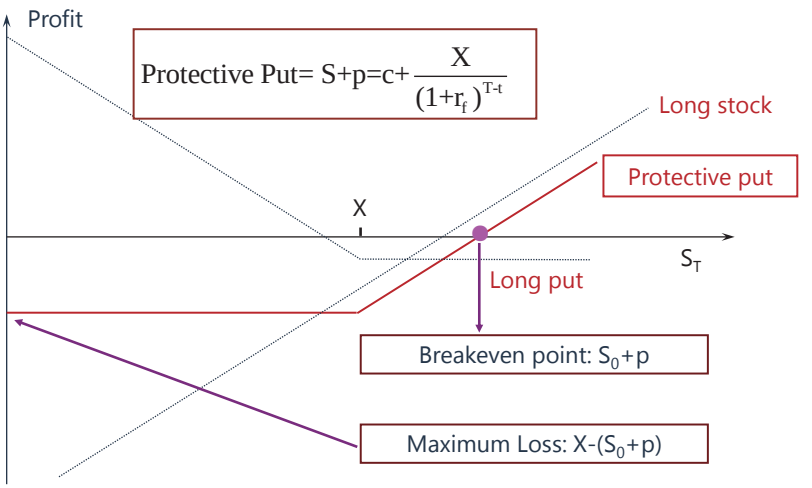
- **Important Summary of risk management applications**
  - **Covered call**
    - ✓ **Consists of:** short call and long stock
    - ✓ **Equivalent to:** short put and long bond
    - ✓ **Similar to:** Short put
    - ✓ **Breakeven point:** $S_0$-c
    - ✓ **Maximum Gain:** X-($S_0$-c)





# Risk management applications

- **Protective Put**



## RM applications of option strategies

- **Important Summary of risk management applications**
  - **Protective put**
    - ✓ **Consists of:** long stock and long put
    - ✓ **Equivalent to:** long call and long bond
    - ✓ **Similar to:** long call
    - ✓ **Breakeven point:** $S_0+p$
    - ✓ **Maximum Loss:** $X-(S_0+p)$





## Topic Weightings in CFA Level I

| Session NO. | Content | Weightings |
|---|---|---|
| Study Session 1 | Ethical and Professional Standards | 15 |
| Study Session 2-3 | Quantitative Methods | 12 |
| Study Session 4-5 | Economics | 10 |
| Study Session 6-9 | Financial Reporting and Analysis | 20 |
| Study Session 10-11 | Corporate Finance | 7 |
| Study Session 12 | Portfolio Management | 7 |
| Study Session 13-14 | Equity | 10 |
| Study Session 15-16 | Fixed Income | 10 |
| Study Session 17 | Derivatives | 5 |
| **Study Session 18** | **Alternative Investments** | **4** |

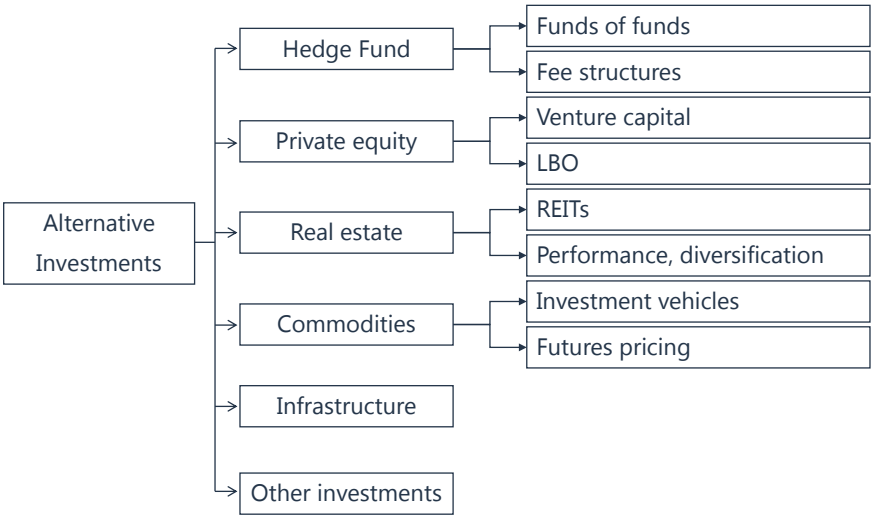




# Reading 60

**Introduction to Alternative Investment**

## Framework of alternative investments







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## Alternative investments

- **Traditional vs. alternative investments**
  - Traditional: long-only investments in stocks, bonds, and cash, etc.
  - Alternative: other investment vehicles which fall outside the scope of traditional investments, extensive use of leverage.
- **Characteristics of alternative investments**
  - Illiquidity of underlying investments;
  - Narrow manage specialization;
  - Low correlation with traditional investments;
  - Low level of regulation and less transparency;
  - Limited and potentially problematic historical risk and return data;
  - Unique legal and tax considerations.

Not always true!
e.g. high correlation in financial crisis







1506(2)

## Alternative investments

- **Returns for alternative investments**
  - Empirically, the mean returns to hedge funds, real estate, private equity, and venture capital exceeded the mean returns to global stocks and bonds.
  - May be due to active exploitation of less efficiently priced assets, illiquidity premiums, and/or account leverage. May also be the result of tax advantage.
- **Risks for alternative investments**
  - The average standard deviation is higher than traditional investments.
    - ✓ But hedge funds have lower average standard deviation and higher mean return, this may be due to hedge fund indices' reporting biases.
- **Historically, the correlation between alternative and traditional investments is low.** It seems that adding alternative investments to a portfolio will improve both portfolio risk and expected return(risk/return profile).

## Risk – return measures

- **Is Sharpe ratio appropriate for alternative investments?**
  - **Illiquid nature of the assets**
    - ✓ Return may not be reliable→ overstated
    - ✓ Standard deviation may not be reliable→ understated
- **Normal distribution?**
  - **Alternative investment return: leptokurtic, negatively skewed**
    - ✓ Non-normal distribution→ cannot use standard deviation for risk measure
    - ✓ VaR, Sortino ratio would be appropriate
    - ✓ Assuming normal distribution→ underestimate downside risk
- **Tail events**
  - **Stress testing/scenario analysis**





## Hedge funds

- **Characteristics of hedge funds**
  - Aggressively managed investment portfolios across asset classes. Use of leverages, take long and short positions, and/or uses derivatives.
  - Aimed at higher returns, either in absolute or relative sense.
  - Private investment partnership open to a limited number of investors willing and able to make a large initial investment.
  - **Hedge fund indices** may not reflect actual performance
    - ✓ Survivorship bias
    - ✓ Backfill bias
  - Less restricted than traditional investments
  - Often impose **restrictions on redemptions.**
    - ✓ Lockup period
    - ✓ Notice period





## Investment structures

- **Most common structure: Partnership**
  - **Limited partner (LP):** LP is the investors who understand and able to assume the risks in the investment.
    - ✓ LP owns a fractional interest based on their investment and as agreed to by the partners.
    - ✓ LP's fractional interest is called his/her share of the partnership.
    - ✓ The partnerships are located in tax-efficient locations.
  - **General partner (GP):** GP runs the fund.

# Funds of funds

- **Funds of funds**
  - Funds of funds are funds that hold a portfolio of hedge funds.
    - ✓ FOFs enable small investors to have returns in hedge funds;
    - ✓ FOFs have some expertise in conducting due diligence on hedge funds;
    - ✓ Negotiate better redemption terms for investors;
    - ✓ FOFs invest in numerous hedge funds, diversifying across fund strategies, investment regions, and management styles;
    - ✓ FOFs managers charge an additional layer of fees beyond the fees charged by the individual hedge funds in the portfolio.







# Hedge fund strategies

- **Event-driven strategies**
- **Relative value strategies**
- **Macro strategies**
- **Equity hedge strategies**







# Event-driven strategies

- **Event-driven strategies**
  - Seek to profit from short-term events that will affect individual companies.
  - Considered “bottom up” strategy.
  - Include long/short positions in common and preferred stocks, as well as debt securities and options.
- **Subdivisions**
  - Merger arbitrage: long the stock of the company being acquired, and short the stock of the acquiring company.
  - Distressed/restructuring: focus on the securities of companies either in bankruptcy or perceived to be near to bankruptcy.
  - Activist shareholder: purchase sufficient equity to influence a company's policies or direction.
  - Special situations: focus on companies that are currently engaged in restructuring activities other than merger/acquisitions and bankruptcy.

# Relative value strategies

- **Relative value strategies**
  - Seek to profit from a pricing discrepancy between related securities.
- **Examples of relative value strategies**
  - Fixed Income Convertible Arbitrage: seek to exploit a perceived mispricing between a convertible bond and its component parts. The strategy typically involves buying convertible debt securities and simultaneously selling the same issuer's common stock.
  - Fixed Income Asset Backed: these strategies focus on the relative value between a variety of ABS and MBS and seek to take advantage of mispricing across different asset-backed securities.
  - Fixed Income General: focus on the relative value within the fixed income markets.
  - Volatility: these strategies typically use options to go long or short market volatility either in a specific asset class or across asset classes.
  - Multi-Strategy: looks for investment opportunities wherever they might exist.





# Macro strategies

- **Macro strategies**
  - "Top-down" approach to identify economic trends;
  - Use long/short positions to potentially profit from a view on overall market direction as influenced by major economic trends or events;
  - Trade opportunistically in the fixed income, equity, currency, and commodity markets.





# Equity hedge strategies

- **Equity hedge strategies**
  - Focused on public equity markets and take long and short positions in equity and equity derivative securities.
- **Examples of equity hedge strategies**
  - Market Neutral: identify under- and over-valued equity securities. Long the undervalued securities, short the overvalued securities and maintain a net position to hedge the market risk.
  - Fundamental Growth: use fundamental analysis to identify companies expected to exhibit high growth and capital appreciation.
  - Quantitative Directional: use technical analysis to identify companies that are under- and overvalued.
  - Short Bias: varies its net short exposure based upon market expectations, going fully short in declining markets.
  - Sector Specific: exploit expertise in a particular sector.

## Hedge fund fees

- **Management fee**
  - Based on capital under management.
    - ✓ Attractive to portfolio managers because the management fee alone will generate significant revenue if assets under management are large.
  - Earned irrespective of returns.
- **Incentive fee**
  - Based on profits net of (or before) management fee;
  - Only earned if the return exceeds a hurdle rate;
  - High water mark → highest value reported.
    - ✓ The hedge fund must recover past losses and return to previous high water mark before any additional incentive fee is earned;
    - ✓ Protect clients from paying twice for the same performance.





## Hedge fund fees

- **Incentive fee**
  - "2 and 20" means 2% management fee and 20% incentive fee for hedge funds.
    - ✓ **FOFs** may charge extra 1% management fee and 10% incentive fee.
- **Negotiable terms**
  - Fees, notice and lockup periods are negotiable with potential investors.
    - ✓ longer investment periods, lower fees.





## Private equity

- **Private equity (PE): investing in privately owned companies or in public companies with the intent to take them private.**
  - Leveraged buyouts (LBOs): acquire companies with a significant percentage of the purchase price financed through debt.
    - ✓ Assets of the target company as the collateral for the debt;
    - ✓ The debt becomes part of the capital structure of the target company.
  - Venture capital: invest in private companies with high growth potential.
  - Development capital: minority equity investment in mature firms that are looking for expanding or restructuring opportunities.
  - Distressed investing: buying the debt of mature companies in financial difficulties.

# Private equity strategies – LBOs

- **LBO with debt financing**
  - If debt financing is unavailable or costly, less likely to occur.
- **Typical LBO capital structure**
  - Equity, leveraged loans, high yield bonds
    - ✓ Mezzanine financing is an alternative to bonds.
    - ✓ Mezzanine financing refers to debt or preferred shares with warrants or conversion options. It pays a higher coupon rate than bank loans and bonds.
  - Leveraged loans carry covenants to protect the investors
    - ✓ Require the company to maintain specified financial ratios within limits, submit information, or operate within certain parameters.
    - ✓ Restrict the company from further borrowing, or impose limits on paying dividends or making operating decisions.
  - Financed through high yield bonds
    - ✓ Key difference: leveraged loans are senior secured debt, while bonds are unsecured in bankruptcy.





# Private equity strategies – LBOs

- **Characteristics of Attractive Target Companies for LBOs**
  - Undervalued/depressed stock price;
    - ✓ The intrinsic value of the company is perceived higher than market price. Private equity firms are willing to pay a premium to the market price to secure shareholder approval.
  - Willing management;
    - ✓ Existing management is looking for a deal.
  - Inefficient companies;
  - Strong and sustainable cash flow;
    - ✓ Cash flow is necessary to make interest payments on the increased debt load.
  - Low leverage;
    - ✓ Easier for PE firms to utilize debt.
  - Assets;
    - ✓ Physical assets can be used as security.





# Private equity strategies – venture capital

- **The stage of venture capital investing**
  - Formative stage
    - ✓ Angel investing: At the idea stage, funds are used to transform the idea into a business plan and to assess market potential. Often provided by individuals.
    - ✓ Seed stage: support product development and/or marketing efforts. The first stage at which VC funds invest.
    - ✓ Early stage: help companies move toward operation but before commercial production and sales have occurred.
  - Later stage: after commercial production and sales have begun but before any IPO. Funds may be used for expansion.
  - Mezzanine stage: prepare to go public. Represent the bridge between the expanding company and the IPO.

## Private equity structure and fees

- **PE firms are structured like hedge funds**
  - PE funds are structured as partnerships where the PE firm is the GP, and investors are LPs.
- **Fee structures are also like hedge funds**
  - Management fees: 1~3% of committed capital.
    - ✓ Distinction from hedge funds: Management fee is based on committed capital, not invested capital.
  - Incentive fees: GP does not earn an incentive fee until the LPs have received initial investment back.
  - Policies that protect LPs
    - ✓ Clawback provision: return any incentive fees until LPs received initial investment back and their profits.





## Private equity – exit strategies

- **Common exit strategies**
  - Trade Sale: sale of a company to a strategic buyer;
  - IPO;
  - Recapitalization;
  - Secondary Sale: sale to another private equity firm or other group of investors;
  - Write-off/Liquidation: when a transaction has not gone well, liquidate the investment to move on to other projects.





## Real estate – performance and benefits

- **Performance measurements**
  - Appraisal index
    - ✓ Use estimates of value (appraisals) as inputs to the indices;
    - ✓ Rely on comparable sales and cash flow analysis techniques;
    - ✓ Understate volatility.
  - Repeat sales (transaction-based) index
    - ✓ Use changes in prices of properties to construct the indices;
    - ✓ Sample selection bias.
  - REIT index
    - ✓ Use the prices of publicly traded shares of REITs to construct the indices;
    - ✓ More frequently traded, more reliable is the index.
- **Diversification benefits**
  - REIT index and equity returns: high correlation;
  - REIT index and bond returns: low correlation.

## Real estate valuation

- **Common techniques for appraising real estate property**
  - Comparable sales approach
    - ✓ Determine an approximate value based on recent sales of similar properties;
    - ✓ Condition, age, location, and size.
  - Income approach
    - ✓ Direct capitalization;
      - ◆NOI → property level CFO, cap rate;
      - ◆Strength of tenants, the level of landlord involvement, the extent of repairs and improvements, the vacancy rate, management and operating costs, expected inflation of costs and rent.
    - ✓ DCF approach.
  - Cost approach
    - ✓ Evaluate the replacement cost of the property.





## Real estate valuation

- **REIT valuation**
  - Income based approach
    - ✓ Similar to the direct capitalization approach;
    - ✓ Funds from operation (FFO) and adjusted funds from operation (AFFO);
    - ✓ Cap rate.
  - Asset based approach
    - ✓ REIT's NAV = MKT value of assets – MKT value of liabilities;
    - ✓ REIT shares trade at prices that differ from its NAV per share (premiums or discounts).





## Commodities

- **Relationship between spot prices and expected future prices**
  - Contango
    - ✓ Futures price > Spot price.
  - Backwardation
    - ✓ Futures price < Spot price.
- Futures markets that are **dominated by long hedgers** (users of the commodity who buy futures to protect against price increases) tend to be in contango.
- Futures markets that are **dominated by short hedgers** (producers of the commodity who short futures to protect against price decreases) tend to be in backwardation.

## Commodities

- **Sources of return and risk**
  - Price return on a long-only investment in commodities derivatives can be positive or negative, depending on the direction of change in the spot price.
  - Collateral yield: an additional return that the investor deposits cash as collateral for the futures contract purchased with the exchange.
  - Roll yield: since commodity derivative contract expire, a speculator or hedger who wants to maintain a position must close out the expiring derivative position and re-establish a new position.
    - ✓ "Rolling over" the position leads to gains (backwardation) or losses (contango) are termed the roll yield.





## Infrastructure

- **Definition:** real, capital intensive, long-lived assets, which are intended for public use and provide essential services.
- **Characteristics of infrastructure**
  - High barriers to entry;
  - Stable cash flows;
  - Protection against inflation;
  - Better match the longer-term liability structure of some investors.
- **Categories of Infrastructure Investments**
  - Economic vs. social infrastructure assets;
  - Brownfield vs. greenfield infrastructure investments.





## Infrastructure

- **Forms of infrastructure investments**
  - Invest directly in the underlying assets;
  - Indirect investment vehicles: MLP.
- Risk and Returns Overview
  - Risk depends on underlying asset;
  - An inherent risk to many infrastructure investments is regulatory risk.

## Summary

- **Important Calculations**
  - **Equity**
    - ✓ Leveraged position & Margin call price;
    - ✓ Index weighting methods and return calculation;
    - ✓ Valuation: GGM, Multi-stage GGM, Price multiple, Justified PE ratio, EV/EBITDA.
  - **Alternatives**
    - ✓ Return calculation: Management fee & Incentive fee.





## It's not the end but just beginning.

If you have people you love, allow them to be free beings. Give and don't expect. Advise, but don't order. Ask, but never demand. It might sound simple, but it is a lesson that may take a lifetime to truly practice. It is the secret to true Love. To truly practice it, you must sincerely feel no expectations from those who you love, and yet an unconditional caring.

如果你有爱的人，允许他们自由随意的存在。给予而不指望；建议而不命令；请求而不要求；可能听起来简单，但这需要一辈子去实践。这就是真爱的秘诀。真正去实践它，你必须对那些你爱的人没有期望，并给予无条件的关爱。