# Equity Investment

## Module 41.1: Markets, Assets, and Intermediaries

### LOS 41.a: Main Functions of the Financial System

- **1. Facilitate saving, borrowing, raising capital, risk management, and trading.**
  - Allows entities (individuals, firms, governments) to:
    - Save for future consumption (e.g., retirement accounts, deposits).
    - Borrow for consumption or investment (e.g., mortgages, bonds).
    - Issue equity to raise capital (e.g., IPOs, private placements).
    - Manage risks via hedging instruments (e.g., forwards, options).
    - Exchange assets or currencies.
- **2. Determine the equilibrium return (interest rate).**
  - Balances total *savings supply* and total *borrowing demand*.
  - Low interest rate ⇒ encourages borrowing, discourages saving.
  - High interest rate ⇒ encourages saving, discourages borrowing.
  - Different rates exist for varying levels of *risk, liquidity, and maturity*.
- **3. Allocate capital to its most efficient uses.**
  - Investors allocate funds to projects with the best *risk–return trade-off*.
  - Efficient allocation requires:
    - Liquid markets,
    - Low transaction costs,
    - Transparent information,
    - Strong regulation and contract enforcement.

## LOS 41.b: Classifications of Assets and Markets

- **Asset Types:**
  - **Financial assets:** stocks, bonds, derivatives, currencies.
  - **Real assets:** real estate, equipment, commodities.
- **Security Classifications:**
  - **Debt:** fixed claim (interest + principal repayment).
  - **Equity:** ownership interest with residual claim.
  - **Public vs. Private:**
    - Public — traded on exchanges, regulated.
    - Private — not publicly traded, illiquid.
  - **Derivative contracts:** value derived from underlying (e.g., oil futures, stock options).
- **Market Classifications:**
  - **Spot Market:** immediate delivery.
  - **Forward/Futures Market:** future delivery.
  - **Primary Market:** new issue sale (IPO).
  - **Secondary Market:** resale among investors.
  - **Money Market:** short-term debt ($\leq$ 1 year).
  - **Capital Market:** long-term debt and equity.
  - **Alternative Market:** hedge funds, commodities, real estate, art, etc.

Exhibit 2: Market and Asset Classification

| **Market Type** | **Instruments** | **Example** |
|---|---|---|
| Money Market | Short-term debt ($\leq$ 1 year) | T-bills, commercial paper |
| Capital Market | Long-term debt and equity | Bonds, stocks |
| Primary Market | New issue | IPO of a company |
| Secondary Market | Trading existing issues | NYSE, NASDAQ |
| Spot Market | Immediate exchange | FX spot trade |
| Forward/Futures | Future settlement | Crude oil futures |
| Alternative | Non-traditional assets | Hedge funds, real estate |

## LOS 41.c: Types of Assets and Their Characteristics

### 1. Securities

- **Fixed-Income (Debt):** promise to repay borrowed funds.
  - *Short-term:* $\leq 1$ year (T-bills, commercial paper).
  - *Intermediate:* 1–10 years (notes).
  - *Long-term:* $> 10$ years (bonds).
  - *Convertible debt:* can be converted into equity shares.
- **Equity:** ownership interest in a firm.
  - *Common stock:* residual claim, variable dividends.
  - *Preferred stock:* fixed dividend, priority over common stock.
  - *Warrants:* right to purchase equity at set price before expiry.
- **Pooled Investment Vehicles:**
  - *Mutual funds:* open- or closed-end funds.
  - *ETFs / ETNs:* exchange-traded; track index or portfolio.
  - *ABS (Asset-Backed Securities):* claims on asset pool (e.g., mortgages).
  - *Hedge funds:* limited partnerships using complex strategies and leverage.

### 2. Currencies

- Issued by central banks.
- **Reserve currencies:** USD, EUR, GBP, JPY, CHF.
- Traded in **spot markets** for immediate delivery.

### 3. Contracts

- **Forwards:** private agreement to trade in the future at a fixed price.
- **Futures:** standardized forward traded on exchange.
- **Swaps:** exchange of cash flows (interest, currency, equity returns).
- **Options:** right (not obligation) to buy (call) or sell (put).
- **Insurance:** pays cash upon adverse event.
- **Credit Default Swaps (CDS):** pay if issuer defaults.

**4. Commodities**

- Include metals, energy, agricultural products.
- Trade via spot, futures, and forwards.

**5. Real Assets**

- Real estate, machinery, infrastructure.
- **Direct ownership:** illiquid, high management cost.
- **Indirect ownership:** via REITs, MLPs, listed firms.

Exhibit 3: Summary of Major Asset Classes

| **Category** | **Example Instruments** | **Key Characteristics** |
|---|---|---|
| Fixed-Income | Bonds, notes, commercial paper | Pays fixed interest; defined maturity |
| Equity | Common, preferred shares, warrants | Ownership interest; dividends optional |
| Derivatives | Forwards, futures, options, swaps | Value derived from underlying asset |
| Currencies | USD, EUR, JPY, GBP | Medium of exchange; traded spot/futures |
| Commodities | Gold, oil, wheat | Tangible goods; used for hedging/speculation |
| Real Assets | Real estate, equipment, infrastructure | Physical; provides income/diversification |

## LOS 41.d: Financial Intermediaries and Their Services

**1. Brokers, Dealers, and Exchanges**

- **Brokers:** match buyers and sellers (earn commission).
- **Block brokers:** handle large trades discreetly to avoid price impact.
- **Investment banks:** underwrite securities, advise on M&A.
- **Exchanges:** provide trading venues, regulate members.
- **ATS / ECN / MTF:** alternative electronic trading systems (no regulation role).
- **Dark pools:** ATSs that conceal orders.
- **Dealers:** trade from own inventory, earn bid–ask spread.
- **Primary dealers:** transact with central banks in government securities.

**2. Securitizers**

- Pool financial assets (e.g., mortgages) ⇒ issue securities backed by pool.
- May use SPVs/SPEs to isolate assets from parent firm.
- Create tranches (senior vs. junior) with different risk-return levels.
- Benefits:
  - Increased liquidity,
  - Lower funding cost,
  - Diversification.

**3. Depository Institutions**

- Examples: banks, savings & loans, credit unions.
- Accept deposits ⇒ make loans.
- Earn spread between deposit and lending rates.
- Provide diversification, transaction services, credit analysis.
- Other lenders: payday lenders, factoring companies.

**4. Insurance Companies**

- Collect premiums to provide risk coverage.
- Diversify across policyholders ⇒ predictable losses.
- Manage:
  - **Moral hazard:** insured takes more risk.
  - **Adverse selection:** high-risk buyers dominate.
  - **Fraud:** deliberate loss to claim benefit.

**5. Arbitrageurs**

- Profit from price discrepancies across markets.
- Provide liquidity, ensure price efficiency.
- *Pure arbitrage* is riskless; *risk arbitrage* involves correlated instruments.
- **Replication:** creating equivalent positions using different assets.

### 6. Clearinghouses and Custodians

- **Clearinghouses:**
  - Act between buyers/sellers,
  - Provide escrow, settlement, margin control,
  - Reduce counterparty risk.
- **Custodians:**
  - Hold and safeguard client securities,
  - Prevent fraud or loss from intermediary failure.

Exhibit 4: Summary of Financial Intermediaries

| **Intermediary Type** | **Primary Function** | **Example** |
|---|---|---|
| Broker | Match buyers and sellers | E&Trade, Charles Schwab |
| Dealer | Trade from own account | Goldman Sachs, JPMorgan dealer desk |
| Exchange | Trading venue, regulation | NYSE, NASDAQ |
| Securitizer | Pool assets, issue ABS | Fannie Mae, Freddie Mac |
| Depository Institution | Accept deposits, make loans | Bank of America |
| Insurance Company | Risk pooling | Allianz, AXA |
| Arbitrageur | Exploit price inefficiencies | Quant hedge funds |
| Clearinghouse | Ensure trade settlement | CME Clearing, Euroclear |
| Custodian | Safekeeping of assets | State Street, BNY Mellon |

# Module 41.2: Positions and Leverage

## LOS 41.e: Compare Positions an Investor Can Take in an Asset

### 1. Long and Short Positions

- **Long position:**
  - Investor **owns** the asset or has the right/obligation to **buy**.
  - Profits when asset price **increases**.
  - Examples:
    - Buying a stock outright.
    - Buying a call option (right to buy).
    - Entering a long forward/futures position.
- **Short position:**

- Investor **borrows and sells** the asset, intending to buy it back later at a lower price.
- Obliged to **return (cover)** the borrowed asset.
- Profits when asset price **falls**.
- The party obliged to deliver an asset under a contract (e.g., forward seller) is also **short**.

**2. Hedging via Short Positions**

- **Purpose:** Reduce risk exposure from existing long position.
- **Mechanism:** Take a short position in a correlated asset.
- **Example:**
  - A wheat farmer with a long position in the crop takes a short futures position in wheat.
  - If wheat prices fall, the gain on the short futures offsets the loss on the crop.
- **Rule of thumb:** "Do in the futures market what you must do in the future."

**3. Long and Short in Options and Swaps**

- **Options:**
  - Long call $\Rightarrow$ benefit if underlying **price rises**.
  - Short call $\Rightarrow$ loss if underlying price rises.
  - Long put $\Rightarrow$ benefit if underlying **price falls**.
  - Short put $\Rightarrow$ loss if underlying price falls.
- **Swaps:**
  - Each party is both long and short.
  - The side that benefits when the quoted rate increases is considered **long**.
- **Currency Contracts:**
  - Long one currency and short another.
  - Example: Long EUR/USD futures $\Rightarrow$ long euro, short dollar.

Exhibit 1: Summary of Long and Short Positions

| **Instrument** | **Long Position** | **Short Position** | **Profit When...** |
|---|---|---|---|
| Stock | Buy shares | Borrow and sell shares | Long: price rises |
| Forward/Future | Obligation to buy later | Obligation to sell later | Short: price falls |
| Call Option | Right to buy | Obligation to sell if exercised | Long: price rises |
| Put Option | Right to sell | Obligation to buy if exercised | Long: price falls |
| Swap | Receive floating rate | Pay floating rate (receive fixed) | Long: quoted rate rises |
| Currency Future | Buy foreign currency | Sell foreign currency | Long: foreign currency appreciates |

## Short Sales and Positions

### 1. Mechanics of a Short Sale

- **Steps:**
  1. Borrow security and sell it on the market.
  2. Deposit sale proceeds and margin collateral with broker.
  3. Repurchase (cover) later and return security to lender.
- **Goal:** Profit from **price decline**.
- **Covering the short:** Repurchasing the borrowed asset to close position.

### 2. Obligations and Costs

- Must pay lender any **dividends or interest** the lender would have received.
- Deposit the **proceeds as collateral**.
- Broker may pay a **short rebate rate** on these funds:
  - Typically $\approx$ overnight interest rate $-$ 0.1%.
  - May be negative for hard-to-borrow securities.
- Broker earns the difference between market rate and short rebate.

### 3. Margin Requirements in Short Sales

- Short seller must also deposit **initial margin** (cash or riskless securities).
- If asset price rises $\Rightarrow$ equity decreases.
- If equity $\downarrow$ below maintenance margin $\Rightarrow$ **margin call**.

Exhibit 2: Summary of Short Sale Mechanics

| **Component** | **Description** |
|---|---|
| Borrowed asset | Security borrowed from another investor via broker |
| Sale proceeds | Held by broker as collateral |
| Payments-in-lieu | Dividends/interest paid to original owner |
| Short rebate rate | Interest rebate paid on collateral (may be negative) |
| Margin requirement | Additional collateral to protect broker |
| Covering the short | Buying back security to close short position |

## LOS 41.f: Leverage, Margin, and Margin Call Calculations

### 1. Leverage and Margin Concepts

- **Leverage:** Use of borrowed funds to magnify returns.
- **Buying on margin:** Investor borrows from broker to purchase securities.
- **Margin loan:** Borrowed funds; interest paid at **call money rate**.
- **Equity:** Investor's own funds in position.
- **Initial margin requirement:** Minimum equity at purchase.
- **Maintenance margin:** Minimum equity percentage to maintain position.

### 2. Key Formulas

$$\text{Leverage Ratio (LR)} = \frac{\text{Value of Asset}}{\text{Value of Equity}} = \frac{1}{\text{Margin Requirement}}$$

$$\text{Return on Equity (ROE)} = \frac{\text{Gain or Loss on Position}}{\text{Initial Equity}}$$

$$\text{Equity} = \text{Value of Asset} - \text{Loan Value}$$

$$\text{Margin \%} = \frac{\text{Equity}}{\text{Value of Asset}}$$

$$\text{Margin Call Price} = P_0 \times \frac{1 - \text{Initial Margin}}{1 - \text{Maintenance Margin}}$$

**3. Example: Margin Transaction Given:**

- Shares purchased: 1,000 at \$100 each.
- Initial margin = 40%.
- Interest on margin loan = 4%.
- Dividends = \$2/share.
- Commission = \$0.05/share (both purchase and sale).
- End of year stock price = \$110.

**Step 1: Compute leverage ratio.**

$$\text{Leverage Ratio} = \frac{1}{0.40} = 2.5$$

**Step 2: Compute initial equity.**

$$\text{Total cost} = 1{,}000 \times 100 = 100{,}000$$

$$\text{Investor equity} = 0.40 \times 100{,}000 = 40{,}000$$

$$\text{Commissions} = 1{,}000 \times 0.05 = 50$$

$$\text{Total initial outflow} = 40{,}050$$

**Step 3: Compute ending inflow.**

$$\text{Stock value} = 1{,}000 \times 110 = 110{,}000$$

$$\text{Dividends} = 1{,}000 \times 2 = 2{,}000$$

$$\text{Interest} = 60{,}000 \times 0.04 = 2{,}400$$

$$\text{Sale commission} = 50$$

$$\text{Net inflow} = 110{,}000 + 2{,}000 - 60{,}000 - 2{,}400 - 50 = 49{,}550$$

**Step 4: Compute Return on Equity.**

$$\text{ROE} = \frac{49{,}550 - 40{,}050}{40{,}050} = 23.72\%$$

**Interpretation:**

- Asset total return = 10% + 2% = 12%
- Expected with 2.5× leverage: 12% × 2.5 = 30%
- Actual ROE lower (23.72%) due to interest and commissions.

Exhibit 3: Margin Transaction Summary

| **Item** | **Amount ($)** |
|---|---|
| Initial Investment (Equity + Commission) | 40,050 |
| Borrowed Funds | 60,000 |
| End-of-Year Stock Value | 110,000 |
| Dividends Received | 2,000 |
| Loan Interest | -2,400 |
| Commissions (buy + sell) | -100 |
| Net Inflow at Year-End | 49,550 |
| Gain on Equity | 9,500 |
| Return on Equity (ROE) | 23.72% |

**4. Example: Margin Call Price Given:**

- Purchase price = $40 per share.
- Initial margin = 50%.
- Maintenance margin = 25%.

**Formula:**

$$P_{\text{margin call}} = P_0 \times \frac{1 - \text{Initial Margin}}{1 - \text{Maintenance Margin}}$$

$$P_{\text{margin call}} = 40 \times \frac{1 - 0.50}{1 - 0.25} = 40 \times \frac{0.5}{0.75} = 26.67$$

**Interpretation:**

- Margin call is triggered if price drops **below $26.67**.
- Investor must deposit cash or additional securities to restore margin.

Exhibit 4: Key Margin Formulas Summary

| **Concept** | **Formula / Description** |
|---|---|
| Leverage Ratio | $= \frac{1}{\text{Initial Margin Requirement}}$ |
| Equity | = Asset Value − Loan Value |
| Margin % | $= \frac{\text{Equity}}{\text{Asset Value}}$ |
| Margin Call Price | $= P_0 \times \frac{1-M_i}{1-M_m}$ |
| Return on Equity (ROE) | $= \frac{\text{Gain on Investment}}{\text{Initial Equity}}$ |
| Effect of Leverage | Amplifies both gains and losses |

# Module 41.3: Order Execution and Validity

## LOS 41.g: Compare Execution, Validity, and Clearing Instructions

**1. Order Instructions Overview** Every trade order contains:

- **Execution Instructions** — how to trade (e.g., market or limit).
- **Validity Instructions** — when the order is valid for execution.
- **Clearing Instructions** — how settlement and delivery occur.

**2. Execution Instructions**

- **Market Order:**
  - Execute immediately at best available price.
  - **Pros:** Immediate execution.
  - **Cons:** Uncertain execution price — possible unfavorable fills.
  - **Example:** Urgent purchase based on private information.
- **Limit Order:**
  - Sets a maximum (buy) or minimum (sell) execution price.
  - **Pros:** Control over price.
  - **Cons:** May not execute if price not reached.

**3. Types of Limit Orders (Relative to Market)**

- **Marketable / Aggressive:**
  - Buy limit above best ask or sell limit below best bid.
  - Executes immediately (fully or partially).
- **Inside the Market:** Between best bid and best ask — sets new quotes.
- **At the Market:** Buy at best bid or sell at best ask — may not fill.
- **Behind the Market:** Away from current market — waits for movement.
- **Far from Market:** Unlikely to execute soon.

**4. Additional Execution Specifications**

- **All-or-Nothing (AON):** Only executed if full size can be filled.
- **Minimum Fill:** Execute only if at least a specified quantity is available.
- **Hidden Orders:** Size hidden from market (broker-only visibility).
- **Iceberg Orders:** Partial display size visible; rest hidden.
- **Purpose:** Conceal large trades to avoid price impact and gauge liquidity.

Exhibit 1: Execution Instructions Summary

| **Order Type** | **Execution Condition** | **Advantage** | **Disadvantage** |
|---|---|---|---|
| Market | Immediate at best price | Fast, certain execution | Price uncertainty |
| Limit | At specific price or better | Price control | No execution guarantee |
| AON | Only full order filled | Avoids partials | May never execute |
| Hidden/Iceberg | Partially or fully hidden | Conceals strategy | May reduce liquidity |
| Aggressive Limit | Crosses spread | Immediate execution | Higher cost |
| Passive Limit | Behind market | Price improvement | Execution delay |

**5. Validity Instructions**

- **Day Order:** Expires if unfilled by end of day.
- **Good-till-Canceled (GTC):** Stays active until executed or canceled.
- **Immediate-or-Cancel (IOC) / Fill-or-Kill (FOK):** Execute immediately or cancel.
- **Good-on-Close (GOC):** Executed only at market close.
- **Good-on-Open (GOO):** Executed only at market open.
- **Stop Orders:** Triggered once stop price reached.
  - **Stop-Sell:** Protects long positions; triggers sell if price falls.
  - **Stop-Buy:** Protects short positions; triggers buy if price rises.

**Example: Stop Order Use**

- Investor buys stock at \$40.
- Places **stop-sell order at \$36** (10% below current).
- Order converts to market order if price $\leq 36$.
- Prevents further losses but may execute below stop price if price gaps down.

Exhibit 2: Validity Instruction Types

| Order Type | When Active | Purpose |
|---|---|---|
| Day Order | During current session | Common default |
| GTC | Until manually canceled | Long-term position entry |
| IOC / FOK | Immediate execution only | Rapid liquidity demand |
| GOC / MOC | At market close | Used by mutual funds |
| Stop-Sell | Below current market | Limit downside on longs |
| Stop-Buy | Above current market | Limit losses on shorts |

**6. Clearing Instructions**

- Specify how trade is settled and which entities handle delivery/payment.
- **Retail:** Cleared by the investor's broker.
- **Institutional:** Settled by custodian or prime broker.
- Important to distinguish:
  - **Long Sale:** Selling owned securities.
  - **Short Sale:** Broker must locate borrowable shares.

## LOS 41.h: Compare Market and Limit Orders

Exhibit 3: Market vs. Limit Orders Comparison

| Characteristic | Market Order | Limit Order |
|---|---|---|
| Execution Speed | Immediate | Conditional (price-based) |
| Price Certainty | Low | High |
| Execution Certainty | High | Low |
| Typical Use | Urgent information-based trades | Price-sensitive trades |
| Risk | Adverse price execution | Missed opportunity |
| Example | Buy immediately at market | Buy if price  $50 |

## LOS 41.i: Primary vs. Secondary Markets

**1. Primary Market**

- **Definition:** Market for new security issuance.
- **Types of Issues:**
  - **IPO (Initial Public Offering):** First-time public issue.
  - **Seasoned Offering (Secondary Issue):** New shares by existing public firm.

**2. Offering Methods**

- **Underwritten Offering:** Investment bank buys entire issue at fixed price.
- **Best Efforts Offering:** Bank sells issue without guarantee.
- **Book Building:** Collecting indications of interest from investors to set price.
- **Hot Issue:** Oversubscribed IPO expected to trade above offer price.
- **Conflict of Interest:**
  - Issuer wants high price; underwriter prefers low price for successful sale.
  - Results in **underpricing** of IPOs.

**3. Alternative Primary Market Mechanisms**

- **Private Placement:** Sale directly to qualified investors.
- **Shelf Registration:** Pre-registered issuance spread over time.
- **Dividend Reinvestment Plan (DRIP):** Dividends reinvested into new shares.
- **Rights Offering:** Existing shareholders buy new shares at discount.

**4. Secondary Market**

- **Definition:** Trading of existing securities between investors.
- **Purpose:** Provide liquidity and price discovery.
- **Importance:**
  - Enhances primary market efficiency.
  - Lowers firms' cost of capital.

Exhibit 4: Primary vs. Secondary Markets

| **Feature** | **Primary Market** | **Secondary Market** |
|---|---|---|
| Participants | Issuers and investors | Investors only |
| Purpose | Raise new capital | Provide liquidity |
| Example | IPO, rights issue | NYSE trade between investors |
| Price Set By | Issuer and underwriter | Supply and demand |
| Importance | Funds to firms | Price/value info |

## LOS 41.j: Market Structures – Trading Mechanisms

### 1. Types of Market Structures

- **Call Market:** Trading occurs at specific times at single clearing price.
- **Continuous Market:** Trading occurs continuously whenever market is open.

### 2. Three Main Market Types

- **Quote-Driven Market (Dealer Market):**
  - Investors trade with dealers who quote bid–ask prices.
  - Also known as *price-driven or OTC markets.*
  - Example: Bond markets, FX markets.
- **Order-Driven Market:**
  - Orders matched by trading rules (exchanges, electronic systems).
  - **Order Matching Rules:**
    - Price priority: highest bid, lowest ask first.
    - Time priority: earliest order at same price executes first.
  - **Trade Pricing Rules:**
    - Uniform pricing (all trades at one price).
    - Discriminatory pricing (based on limit price).
  - Example: NYSE, NASDAQ order book.
- **Brokered Market:**
  - Brokers find counterparties for unique/illiquid assets.
  - Example: Real estate, artwork, large block trades.

Exhibit 5: Comparison of Market Structures

| Type | Who Trades With Whom | Price Discovery | Examples |
|---|---|---|---|
| Quote-Driven | Investor ↔ Dealer | Dealer quotes | Bonds, FX |
| Order-Driven | Investor ↔ Investor | Matching rules | Stock exchanges |
| Brokered | Investor ↔ Investor (via broker) | Negotiation | Real estate, large blocks |

**3. Market Transparency**

- **Pre-trade transparency:** Quotes/order info available.
- **Post-trade transparency:** Prices and volumes disclosed after trade.
- **Implications:**
  - High transparency ⇒ better price discovery, lower costs.
  - Dealers prefer opacity (information advantage).

## LOS 41.k: Characteristics of a Well-Functioning Financial System

**1. Key Characteristics**

- **Complete Markets:** All needs for saving, borrowing, risk management met.
- **Operational Efficiency:** Low transaction costs.
- **Informational Efficiency:** Prices reflect all available information.
- **Allocational Efficiency:** Capital flows to most productive uses.

**2. Key Intermediary Roles**

- Provide trading venues (exchanges, ATS).
- Supply liquidity.
- Securitize assets.
- Manage depositories, clearinghouses, banks, insurance, advisory services.

**3. Benefits**

- Lowers cost of capital.
- Improves investment opportunities.
- Facilitates capital formation and risk sharing.
- Promotes economic growth.

Exhibit 6: Types of Market Efficiency

| Efficiency Type | Definition |
|---|---|
| Operational Efficiency | Low transaction and information costs |
| Informational Efficiency | Prices reflect all known information |
| Allocational Efficiency | Capital directed to best uses |

## LOS 41.l: Objectives of Market Regulation

### 1. Problems Without Regulation

- Fraud, theft, insider trading.
- Costly information.
- Default risk.
- Loss of investor confidence.

### 2. Objectives of Regulation

- Protect unsophisticated investors.
- Ensure competency and performance transparency (e.g., CFA Program, GIPS).
- Prevent insider exploitation.
- Require standardized financial reporting (IASB/IFRS).
- Impose capital adequacy for long-term obligations (banks, insurers).

### 3. Types of Regulators

- **Government Regulators:** Public authorities enforcing laws.
- **Self-Regulating Organizations (SROs):** Industry bodies overseeing members (e.g., exchanges, clearinghouses).

### 4. Outcomes of Effective Regulation

- Maintains market liquidity.
- Reduces risk of fraud/default.
- Encourages participation and capital formation.
- Supports economic growth.

Exhibit 7: Market Regulation – Summary

| **Regulatory Goal** | **Purpose** |
|---|---|
| Fraud/Insider Protection | Preserve market trust |
| Performance Standards | Ensure fair evaluation of managers |
| Transparency Rules | Lower info costs and improve pricing |
| Capital Requirements | Ensure solvency and stability |
| SRO Oversight | Maintain discipline and compliance |

# Module 42.1: Index Weighting Methods

## LOS 42.a: Describe a Security Market Index

- **Definition:** A *security market index* measures the performance of an asset class, market, or segment.
- **Constituent securities:** Individual assets included in the index.
- **Index value:** Numeric representation computed from market prices of constituents.
- **Index return:** Percentage change in index value over a period.

$$R_t = \frac{I_t - I_{t-1}}{I_{t-1}}$$

- **Purpose:** Benchmark performance, create investment products (ETFs, futures), and represent markets.

Exhibit 1: Key Features of a Market Index

| **Feature** | **Description** |
|---|---|
| Asset class coverage | Equities, bonds, commodities, REITs, etc. |
| Constituent count | Broad (S&P 500) vs. narrow (DJIA 30) |
| Calculation | Weighted average of constituent prices or values |
| Usage | Benchmark, performance tracking, portfolio construction |

## LOS 42.b: Calculate and Interpret Index Value, Price Return, and Total Return

### 1. Types of Index Returns

- **Price Index:** Uses only prices of constituents. $\Rightarrow$ Measures capital gains only.

$$R_P = \frac{P_t - P_{t-1}}{P_{t-1}}$$

- **Return Index (Total Return):** Includes price change + income (dividends, coupons). ⇒ Measures total wealth change.

$$R_T = \frac{(P_t + D_t) - P_{t-1}}{P_{t-1}}$$

**2. Linking Returns over Multiple Periods**

$$R_{\text{period}} = (1 + R_1)(1 + R_2) \cdots (1 + R_n) - 1$$

**Example:**

$$R_P = (1.005)(1.0104) - 1 = 0.0155 = 1.55\%$$

If starting index $I_0 = 100$:

$$I_2 = 100 \times 1.0155 = 101.55$$

Exhibit 2: Comparison – Price Return vs. Total Return

| **Aspect** | **Price Index** | **Return Index** |
|---|---|---|
| Includes dividends/interest? | No | Yes |
| Reflects capital gain only? | Yes | No (includes income) |
| Example | S&P 500 Price Index | S&P 500 Total Return Index |
| Use | Market performance | Investor total return tracking |

## LOS 42.c: Choices and Issues in Index Construction and Management

**1. Key Decisions by Index Providers**

- Define the **target market**: broad (e.g., global equities) or narrow (e.g., U.S. small-cap value).
- Determine **constituent selection**: objective rule-based or discretionary.
- Choose **weighting scheme**: price, equal, market cap, float-adjusted, or fundamental.
- Set **rebalancing frequency**: to realign weights to methodology.
- Set **re-examination schedule**: to revise constituents and structure.

**2. Selection Criteria**

- **Objective:** Size, liquidity, sector, style, or geographic region.
- **Subjective:** Committee review (e.g., S&P Index Committee).

## LOS 42.d: Compare Weighting Methods Used in Index Construction

### 1. Price-Weighted Index (PWI)

- **Formula:**

$$I = \frac{\sum P_i}{d}$$

  where $d$ = divisor (adjusted for splits and changes).

- **Examples:** DJIA (30 U.S. stocks), Nikkei 225.
- **Characteristics:**
  - Simple to compute.
  - High-priced stocks dominate weight.
  - Sensitive to splits/dividends.
- **Matching portfolio:** Equal number of shares of each stock.

**Example 1: Price-Weighted Index Return**

$$I_{Dec31} = \frac{10 + 20 + 60}{3} = 30$$

$$I_{Jan31} = \frac{20 + 15 + 40}{3} = 25$$

$$R = \frac{25 - 30}{30} = -16.67\%$$

**Example 2: Adjusting for a Stock Split**

$$I_{Day1} = \frac{10 + 20 + 90}{3} = 40$$

Stock C splits 2-for-1 $\Rightarrow$ new price = 45.

$$\frac{10 + 20 + 45}{d} = 40 \Rightarrow d = 1.875$$

Exhibit 3: Price-Weighted Index Summary

| | |
|---|---|
| **Advantage** | Simple computation |
| **Disadvantages** | Overweights high-price stocks; distorted by splits |
| **Replication** | Equal number of shares per stock |

**2. Equal-Weighted Index (EWI)**

- **Formula:**

$$R_{EWI} = \frac{1}{N} \sum_{i=1}^{N} R_i$$

- **Characteristics:**
  - Equal dollar weight per constituent.
  - Requires frequent rebalancing → high transaction costs.
  - Overweights smaller-cap firms; underweights large-caps.
- **Examples:** Value Line Composite Average, FT Ordinary Share Index.

**Example 3: Equal-Weighted Index Calculation** If three stocks have returns of 4%, 2%, and 1%:

$$R_{EWI} = \frac{4 + 2 - 1}{3} = 1.67\%$$

If starting index = 131:

$$I_1 = 131 \times (1 + 0.0167) = 133.19$$

Exhibit 4: Equal-Weighted Index Summary

| | |
|---|---|
| **Advantage** | Simple, unbiased by price or size |
| **Disadvantages** | Requires rebalancing, higher costs |
| **Bias** | Toward smaller-cap, high-volatility stocks |

**3. Market-Capitalization-Weighted Index (MCWI)**

- **Formula:**

$$w_i = \frac{P_i Q_i}{\sum P_i Q_i} \quad \text{and} \quad I = \frac{\sum P_i Q_i}{\sum P_i^0 Q_i^0} \times I_0$$

- **Characteristics:**
  - Reflects aggregate investor wealth.
  - Automatically adjusts for splits/dividends.
  - No need for rebalancing unless constituents change.
- **Disadvantage:** Overweights overvalued, underweights undervalued stocks.
- **Example:** S&P 500.

Exhibit 5: Market-Cap-Weighted Index Summary

| | |
|---|---|
| **Advantage** | Represents total market wealth; low turnover |
| **Disadvantage** | Momentum bias; overweights expensive stocks |
| **Example** | S&P 500, MSCI World |

**Example 4: Market-Cap Index Calculation**

$$\text{Base total MV} = \$80\,\text{million}; \quad \text{End MV} = \$95\,\text{million}$$

$$I = \frac{95}{80} \times 100 = 118.75 \Rightarrow R = 18.75\%$$

**4. Float-Adjusted Market-Cap-Weighted Index (FAMCI)**

- Adjusts $Q_i$ to include only publicly tradable (float) shares. Excludes shares held by insiders, governments, or cross-holdings.
- **Free Float:** Excludes shares restricted from foreign ownership.
- **Effect:** Reduces weight of firms with large controlling shareholders.
- **Used by:** MSCI indices, FTSE indices.

**5. Fundamental-Weighted Index (FWI)**

- **Weights:** Based on firm fundamentals (e.g., earnings, book value, cash flow, dividends).
- **Advantages:**
  - Reduces price bias; avoids overweighting overvalued stocks.
  - Implicit *value tilt* — overweights high book-to-market, high earnings-yield firms.
- **Disadvantages:**
  - Requires accounting data updates.
  - Higher rebalancing cost.

## LOS 42.e: Calculate and Analyze Index Value and Return by Weighting Method

**1. Price-Weighted Index Example**

- Initial prices: $10, 20, 60 \rightarrow$ Index $= (10 + 20 + 60)/3 = 30$
- Next month: $20, 15, 40 \rightarrow$ Index $= 25$

$$R = \frac{25 - 30}{30} = -16.67\%$$

Exhibit 6: Comparison of Weighting Methods

| Method | Basis of Weight | Main Implication |
|---|---|---|
| Price-Weighted | Stock price | High-priced stocks dominate |
| Equal-Weighted | Equal dollar per stock | Small-cap bias, frequent rebalancing |
| Market-Cap-Weighted | Market value (price × shares) | Reflects market wealth; momentum bias |
| Float-Adjusted MCW | Publicly tradable market cap | Excludes non-tradable shares |
| Fundamental-Weighted | Fundamentals (earnings, book value) | Value bias; avoids price distortion |

### 2. Adjusting Divisor for Split

$$(10 + 20 + 45)/d = 40 \Rightarrow d = 1.875$$

Maintains index continuity after Stock C split.

### 3. Price vs. Market-Cap Weight Example

- Three firms:

| Firm | Price ($) | Shares |
|---|---|---|
| A | 100 | 100,000 |
| B | 10 | 1,000,000 |
| C | 1 | 20,000,000 |

- **Base market capitalization:**

$$(100 \times 100{,}000) + (10 \times 1{,}000{,}000) + (1 \times 20{,}000{,}000) = \$40\,000\,000$$

- **If A doubles to 200:** Price-Weighted Index ↑ 33 points; MCW Index ↑ less.
- **If C doubles to 2:** Price-Weighted Index barely moves (0.33 pt); MCW Index moves strongly.

Exhibit 7: Price- vs. Market-Cap Weight Sensitivity

| Stock Change | Effect on Price-Weighted Index | Effect on MC-Weighted Index |
|---|---|---|
| High-price stock doubles | Large impact | Small impact if small-cap |
| Low-price stock doubles | Minimal impact | Large impact if large-cap |

### 4. Equal-Weighted Index Example

- Three stocks initially equal-weighted; initial index = 131.
- Returns = 5%, 2%, 8% → Average = $(5 \;\; 2 + 8)/3 = 3.67\%$.

$$I_1 = 131 \times (1.0367) = 135.8$$

- Rebalancing ensures equal dollar weight each period.

Exhibit 8: Index Return Calculation Summary

| Method | Computation | Driver of Change |
|---|---|---|
| Price-Weighted | Avg. of prices / adjusted divisor | Price of high-priced stocks |
| Equal-Weighted | Average of individual returns | Average of all stocks equally |
| Market-Cap-Weighted | Total market value / base value | Market value of large firms |

**Summary Insight:**

- **Price-weighted:** Impact $\propto$ stock price.
- **Equal-weighted:** Impact $\propto$ average return.
- **Market-cap-weighted:** Impact $\propto$ firm size.
- **Fundamental-weighted:** Impact $\propto$ accounting fundamentals.

# Module 42.2: Uses and Types of Indexes

## LOS 42.f: Rebalancing and Reconstitution of an Index

### 1. Rebalancing

- **Definition:** Process of adjusting the **weights of index constituents** to target weights after price movements.
- **Purpose:** Maintain index consistency with its weighting methodology.
- **Frequency:** Typically quarterly or semiannual.
- **Affects:** Especially relevant for **equal-weighted indexes**, where weights drift as prices change.
- **Mechanics:**
  - Price-weighted and market-cap-weighted indexes adjust automatically via price changes.
  - Equal-weighted indexes require **manual rebalancing**.
- **Example:**
  - If one stock doubles in price while others remain constant, it gains excess weight in the index.
  - Rebalancing restores equal weight among constituents.

Exhibit 1: Rebalancing Overview

| Index Type | Rebalancing Need | Reason |
|---|---|---|
| Price-weighted | Rare | Prices adjust weights automatically |
| Market-cap-weighted | Rare | Market value adjusts automatically |
| Equal-weighted | Frequent | Price changes distort equal weights |
| Fundamental-weighted | Periodic | Rebased on updated fundamentals |

**2. Reconstitution**

- **Definition:** Process of **adding or deleting** securities in the index.
- **Purpose:** Ensure index reflects the intended market segment.
- **Triggers:**
  - Corporate actions: mergers, bankruptcies, delistings.
  - Firms no longer meeting index criteria.
- **Effect on Prices:**
  - **Additions:** Price often rises (index funds buy to match benchmark).
  - **Deletions:** Price often falls (funds sell).

Exhibit 2: Rebalancing vs. Reconstitution

| Aspect | Rebalancing | Reconstitution |
|---|---|---|
| Definition | Adjust weights | Add/delete constituents |
| Goal | Maintain target weights | Maintain representative universe |
| Frequency | Quarterly / periodic | Annual or as needed |
| Example | Equal-weighted index reset | Replace delisted stock |
| Impact | Transaction costs | Price impacts on added/removed securities |

## LOS 42.g: Uses of Security Market Indexes

**1. Reflection of Market Sentiment**

- Index return represents **aggregate investor confidence**.
- Example: DJIA (30 U.S. stocks) tracks large-cap sentiment but not the entire market.

**2. Benchmark for Performance Evaluation**

- Active managers are compared to consistent benchmarks.
- **Style match required:**
  - Value managers → value index.
  - Growth managers → growth index.

**3. Measure of Market Return and Risk**

- Historical index returns used to estimate:

$$E(R_i),\ \sigma_i,\ \rho_{ij}$$

- Used for **asset allocation** decisions among asset classes.

**4. Measure of Beta and Risk-Adjusted Return**

- In CAPM:

$$E(R_i) = R_f + \beta_i[E(R_m) - R_f]$$

- Index serves as proxy for market portfolio ($R_m$).
- Used for estimating beta, expected return, and Jensen's alpha.

**5. Model Portfolio for Passive Investing**

- **Index funds:** Replicate benchmark index performance.
- **Forms:** Mutual funds, ETFs, and separately managed accounts.
- **Advantages:** Low cost, transparency, and diversification.

Exhibit 3: Summary – Uses of Market Indexes

| **Use** | **Description / Example** |
|---|---|
| Market Sentiment | Gauge investor confidence (e.g., DJIA, S&P 500) |
| Benchmark | Evaluate manager skill vs. comparable index |
| Asset Allocation | Estimate expected return and risk of asset class |
| CAPM Input | Proxy for market portfolio for $\beta$ estimation |
| Passive Investment | Replication via index funds or ETFs |

## LOS 42.h: Types of Equity Indexes

### 1. Broad Market Index

- Represents overall market performance.
- Covers large proportion (usually $> 90\%$) of total market capitalization.
- **Example:** Wilshire 5000 Index (over 6,000 U.S. stocks).

### 2. Multi-Market Index

- Combines indexes from several countries.
- Used for regional or global comparisons.
- **Examples:**
  - MSCI World Index (developed markets).
  - MSCI Emerging Markets Index.
  - Latin America Index.

### 3. Multi-Market Index with Fundamental Weighting

- Country weights based on **economic fundamentals** (e.g., GDP) instead of market cap.
- **Purpose:** Avoid overweighting countries with previously inflated equity markets.

### 4. Sector Index

- Measures performance of industry sectors (health care, financials, technology).
- Used for **cyclical analysis** and sector rotation strategies.
- Can be national or global (e.g., MSCI Global Financials Index).

### 5. Style Index

- Captures market **capitalization segment** and **investment style** (value/growth).
- **Common classifications:**
  - Large-cap, mid-cap, small-cap.
  - Value (high book-to-market, high dividend yield).
  - Growth (high P/E, low dividend yield).
- **Example:** Russell 1000 Value Index, Russell 2000 Growth Index.
- **Note:** Higher turnover due to migration between categories.

Exhibit 4: Equity Index Classification Summary

| **Index Type** | **Basis** | **Example** |
|---|---|---|
| Broad Market | Total market coverage | Wilshire 5000, Russell 3000 |
| Multi-Market | Several national indexes | MSCI World, FTSE All-World |
| Fundamentally Weighted | Economic factor (GDP) | GDP-weighted Global Index |
| Sector | Industry/sector | MSCI Healthcare, S&P Financials |
| Style | Market cap + style | Russell 2000 Growth/Value |

## LOS 42.i: Compare Types of Security Market Indexes

- **Equity Indexes:** Usually market-cap or float-adjusted.
- **Fixed-Income Indexes:** Segment by maturity, credit, issuer, or geography.
- **Commodity Indexes:** Based on futures prices, not spot.
- **Real Estate Indexes:** Based on property values or REITs.
- **Hedge Fund Indexes:** Equal-weighted fund performance averages.

Exhibit 5: Comparative Summary – Global Index Types

| **Category** | **Weighting Scheme** | **Typical Adjustment** |
|---|---|---|
| Equity | Market-cap or float-adjusted | Adjust for free float |
| Fixed-Income | Market value of bonds | Exclude illiquid issues |
| Commodity | Futures-based | Adjust for roll yield and weights |
| Real Estate | Market value / REITs | Use appraisal or transaction prices |
| Hedge Funds | Equal-weighted returns | Self-reporting biases |

## LOS 42.j: Types of Fixed-Income Indexes

### 1. Characteristics

- Huge variety: government, corporate, municipal, mortgage-backed, high-yield, etc.
- **Index Segmentation:**
  - By **sector:** Government, corporate, sovereign.
  - By **maturity:** Short-, intermediate-, long-term.
  - By **rating:** Investment-grade vs. high-yield.
  - By **region:** Domestic vs. global bonds.

**2. Challenges in Construction**

- **Large universe:** Thousands of issues, frequent maturities and redemptions.
- **Illiquidity:** Many bonds trade infrequently, requiring dealer quotes or estimation.
- **High turnover:** Bonds mature; constant rebalancing needed.
- **Replication difficulty:** High transaction costs and data intensity.

**3. Examples**

- Bloomberg Barclays Global Aggregate Bond Index.
- ICE BofA U.S. Corporate Bond Index.
- JP Morgan Emerging Market Bond Index (EMBI).

Exhibit 6: Fixed-Income Index Construction Issues

| **Issue** | **Explanation** |
|---|---|
| Vast universe | Many issuers and instruments |
| Infrequent trading | Prices estimated from dealer quotes |
| High turnover | Maturity and replacement frequent |
| Replication cost | Expensive to track due to illiquidity |

## LOS 42.k: Indexes Representing Alternative Investments

**1. Commodity Indexes**

- **Based on:** Prices of futures contracts (not spot commodities).
- **Major examples:**
  - S&P GSCI (formerly Goldman Sachs Commodity Index).
  - Thomson Reuters/CoreCommodity CRB Index.
- **Weighting Methods:**
  - Equal-weighted, production-weighted, or fixed-weighted.
  - Index exposures differ significantly across sectors.
- **Return components:**

$$R_{futures} = R_{rf} + R_{price} + R_{roll}$$

**2. Real Estate Indexes**

- **Based on:**
  - Property appraisals (subjective).
  - Repeat sales (historical transactions).
  - REIT performance (market-based, liquid).
- **Example:** FTSE NAREIT Index (REIT-based real estate performance).
- **Advantage:** REIT indexes offer daily pricing and liquidity.

**3. Hedge Fund Indexes**

- **Construction:** Equal-weighted average of self-reported hedge fund returns.
- **Issues:**
  - **Selection bias:** Only successful funds report results.
  - **Survivorship bias:** Poor performers drop out, inflating returns.
  - **Lack of standardization:** Funds report to different providers.

Exhibit 7: Comparison – Alternative Investment Indexes

| Asset Class | Index Type | Key Considerations |
|---|---|---|
| Commodities | Futures-based (e.g., S&P GSCI) | Weighting scheme, roll yield |
| Real Estate | REIT or appraisal-based | Liquidity, valuation method |
| Hedge Funds | Equal-weighted fund returns | Reporting bias, survivorship bias |

**Summary Insight:**

- Indexes represent various asset classes for benchmarking, analysis, and investment.
- Each index type faces unique construction and replication challenges.
- Alternative investment indexes improve diversification but have data biases and methodological inconsistencies.

# Module 43.1: Market Efficiency

## LOS 43.a: Market Efficiency and Related Concepts

**Definition:**

- A market is **informationally efficient** if prices **fully, quickly, and rationally reflect all available information.**
- Prices are **unbiased estimates** of intrinsic value—deviations are random.
- Intuitive restatement: "You can't consistently beat the market."

**Implications:**

- In an efficient market:
  - Expected return = equilibrium risk-adjusted return.
  - Active strategies cannot systematically outperform passive index strategies.
- Passive strategy (index investing) preferred due to lower cost and minimal transaction friction.

**Measurement of Efficiency:**

- **Adjustment speed:** Time for prices to reflect new information.
- Highly efficient markets (e.g., FX markets): lag  seconds.
- Inefficient markets: price adjustment lag permits abnormal profits.

**Price Reactions:**

- Only **unexpected** (new) information affects price.
- Expected information has no price effect.
- Example: If earnings +45% vs. expected +20% → price increases; if +45% vs. expected +70% → price falls.

Exhibit 1: Key Concept—Information and Price Response

| **Type of Information** | **Price Impact** |
|---|---|
| Expected (well-anticipated) | No effect on price |
| Unexpected positive | Price rises |
| Unexpected negative | Price falls |

## LOS 43.b: Market Value vs. Intrinsic Value

**Definitions:**

- **Market value:** Current market price.
- **Intrinsic (fundamental) value:** Rational investor's estimated true value, based on full knowledge of asset's characteristics (cash flows, risk, maturity, liquidity).

**Relationship:**

- In efficient markets ⇒ Market value  Intrinsic value.
- In inefficient markets ⇒ Mispricing occurs, allowing **active managers** to exploit price-value gaps.

**Notes:**

- Intrinsic value estimates vary among investors due to model differences.
- More complex assets → harder to estimate intrinsic value.
- Intrinsic values constantly change as new information arrives.

Exhibit 2: Market vs. Intrinsic Value

| **Concept** | **Description** |
|---|---|
| Market Value | Current observable trading price |
| Intrinsic Value | Estimated true worth based on fundamentals |
| Efficient Market | Market value  Intrinsic value |
| Inefficient Market | Temporary divergence → opportunity |

## LOS 43.c: Factors Affecting Market Efficiency

### 1. Number of Market Participants

- More participants (analysts, traders, investors) ⇒ greater efficiency.
- Restricted foreign access or low participation ⇒ inefficiency.

### 2. Availability of Information

- More publicly available, low-cost information ⇒ higher efficiency.
- Developed markets (e.g., NYSE) more efficient than emerging markets.
- Regulations (e.g., SEC Reg FD) promote equal information access.

### 3. Impediments to Trading (Arbitrage)

- Arbitrage aligns prices across markets.
- **High transaction costs** or **restricted short-selling** reduce efficiency.

Exhibit 3: Determinants of Market Efficiency

| **Factor** | **Effect on Efficiency** |
|---|---|
| Number of Participants | ↑ Participants → ↑ Efficiency |
| Information Availability | ↑ Information → ↑ Efficiency |
| Trading Impediments | ↑ Impediments → ↓ Efficiency |
| Transaction Costs | ↑ Costs → ↓ Efficiency |
| Short-Selling Restrictions | ↓ Efficiency (overvaluation persists) |

**4. Transaction and Information Costs**

- Market is efficient if, **after costs**, no abnormal risk-adjusted profits exist.

## LOS 43.d: Forms of Market Efficiency

**Eugene Fama's Three Forms of the EMH:**

1. **Weak-Form Efficiency:**
   - Prices reflect all past **market data** (price, volume).
   - Technical analysis cannot consistently generate abnormal returns.
2. **Semi-Strong-Form Efficiency:**
   - Prices reflect all **public information** (market + nonmarket).
   - Fundamental analysis cannot consistently generate abnormal returns.
3. **Strong-Form Efficiency:**
   - Prices reflect **all information**, public and private (insider).
   - No investor (even insiders) can earn abnormal returns.
   - Unrealistic due to insider trading laws.

Exhibit 4: Forms of the Efficient Market Hypothesis

| **Form** | **Information Set** | **Strategy Impact** | **Efficiency Implication** |
|---|---|---|---|
| Weak | Past price and volume data | Technical analysis useless | Common in developed markets |
| Semi-Strong | All public information | Fundamental analysis useless | Generally supported |
| Strong | All public + private information | No one can beat market | Unrealistic in practice |

## LOS 43.e: Implications for Analysis and Portfolio Management

**Testing Efficiency:**

- Abnormal return = Actual return – Expected return (from CAPM or multi-factor model).

$$\text{Abnormal return} = R_i - [R_f + \beta_i(R_m - R_f)]$$

**1. Technical Analysis**

- Uses historical prices/volume.
- Ineffective under weak-form efficiency.
- Some success in emerging markets due to less efficiency.

**2. Fundamental Analysis**

- Uses financial statement and economic data.
- Ineffective under semi-strong efficiency (public info already priced in).
- Still useful:
  - To improve efficiency through price discovery.
  - For highly skilled analysts.

**3. Event Studies**

- Tests price reaction to public events (e.g., earnings announcements).
- Efficient markets: No abnormal pre/post-announcement returns.

**4. Active vs. Passive Management**

- Semi-strong efficiency → Passive (index) investing preferred.
- Role of active manager:
  - Define risk-return objectives.
  - Optimize diversification, asset allocation, and tax strategy.

## LOS 43.f: Market Anomalies

**Definition:**

- A **market anomaly** is a pattern in returns that contradicts EMH.
- May arise from **data mining, mispricing, or behavioral bias**.

Exhibit 5: Market Efficiency and Analytical Value

| **Form** | **Useful Strategy** | **Useless Strategy** |
|---|---|---|
| Weak | Fundamental / Active mgmt | Technical analysis |
| Semi-Strong | Index investing, asset allocation | Fundamental analysis |
| Strong | None (no abnormal returns possible) | All active management |

**Avoiding Data-Snooping Bias:**

- Confirm anomalies with large, independent samples and across time.
- Check if relationship has valid **economic rationale**.

**A. Time-Series Anomalies**

- **Calendar Effects:**
  - January effect: Small-cap stocks outperform early January (due to tax-loss selling and window dressing).
  - Other effects (month-end, day-of-week, holiday) mostly disappeared after discovery.
- **Overreaction / Momentum:**
  - Loser stocks outperform winners in subsequent years (overreaction).
  - Short-term momentum: high past returns continue briefly.
  - Both contradict weak-form efficiency.

**B. Cross-Sectional Anomalies**

- **Size Effect:** Small-cap stocks historically outperform large-caps (disappeared in later data).
- **Value Effect:** Value stocks (low P/E, low P/B, high dividend yield) outperform growth stocks.
  - Violates semi-strong efficiency.
  - May reflect higher (unmeasured) risk.

**C. Other Anomalies**

- **Closed-End Fund Discounts:** Funds trade below NAV — partially explained by fees/taxes.
- **Earnings Announcements:** Post-announcement drift suggests delayed reaction to information.

- **IPOs:** Underpriced initially; underperform long-term due to investor overreaction.
- **Economic Fundamentals:** Returns correlated with dividend yield, volatility, interest rates—expected in efficient markets.

**Investor Implications:**

- Most anomalies disappear once discovered or are too small to profit after costs.
- Many are statistical artifacts or compensation for unobserved risk.
- **Conclusion:** Markets are largely efficient; anomaly-based strategies unreliable.

Exhibit 6: Common Market Anomalies and Possible Causes

| **Anomaly** | **Observed Pattern** | **Possible Explanation** |
|---|---|---|
| January Effect | Small-cap returns spike in Jan | Tax-loss selling, window dressing |
| Overreaction | Losers outperform winners later | Investor overreaction to news |
| Momentum | Winners keep outperforming short term | Herding, delayed reaction |
| Size Effect | Small ¿ large | Risk premium, vanished post-discovery |
| Value Effect | Value ¿ growth | Risk premium or inefficiency |
| Earnings Drift | Post-announcement drift | Delayed info incorporation |
| Closed-End Discount | NAV ¿ market price | Illiquidity, taxes, sentiment |
| IPO Effect | Short-term rise, long-term fall | Overreaction, mispricing |

## LOS 43.g: Behavioral Finance and Market Anomalies

**Definition:**

- Behavioral finance studies how psychological biases affect investor decisions and market outcomes.
- Investors are not always rational, utility-maximizing agents.

**Key Behavioral Biases:**

- **Loss Aversion:** Investors dislike losses more than they like equivalent gains.
- **Overconfidence:** Investors overestimate their skill in interpreting data and identifying mispricings.
- **Herding:** Investors mimic others instead of relying on independent analysis.
- **Information Cascade:** Investors follow actions of perceived informed traders, potentially accelerating information incorporation.

**Implications:**

- Behavioral biases can cause temporary deviations from intrinsic value.
- However, markets can remain **efficient on average** if irrational actions offset.
- Semi-strong efficiency can still hold even if individuals act irrationally.

Exhibit 7: Behavioral Biases and Market Impact

| **Bias** | **Description** | **Market Effect** |
|---|---|---|
| Loss Aversion | Dislike for losses stronger than for gains | Excess risk aversion, underreaction |
| Overconfidence | Overestimation of forecasting skill | Overtrading, mispricing |
| Herding | Following others' trades blindly | Asset bubbles, volatility |
| Information Cascade | Mimicking informed investors | Faster or distorted price reaction |

**Conclusion:**

- Behavioral finance provides psychological explanations for anomalies.
- Even if individuals are irrational, overall market efficiency can still hold.
- Prices may deviate temporarily but generally revert to reflect fundamentals.

# Module 44.1: Types of Equity Investments

## LOS 44.a: Characteristics of Types of Equity Securities

### 1. Common Shares (Common Stock)

- Represent **ownership interest** in the firm and residual claim on assets.
- **Residual claim:** Paid after debtholders and preferred shareholders upon liquidation.
- **Control rights:**
  - Vote for **board of directors**, mergers, auditor selection.
  - Can vote in person or by **proxy** (appoint another person to vote).
- **Dividend policy:**
  - Not contractually required; at discretion of firm.
  - Dividends may vary or be omitted.

**2. Voting Systems**

- **Statutory Voting:**
  - Each share = one vote per director position.
  - Example: 100 shares × 3 directors = 100 votes per election.
  - Favours majority shareholders.
- **Cumulative Voting:**
  - Total votes = shares × number of directors.
  - Votes can be allocated freely (e.g., all to one candidate).
  - Enables **minority representation**.
  - Example: 100 shares × 3 directors = 300 votes total; may allocate all 300 to one director.
  - A 30% shareholder can elect 3 of 10 directors.

Exhibit 1: Comparison – Statutory vs. Cumulative Voting

| **Feature** | **Statutory Voting** | **Cumulative Voting** |
|---|---|---|
| Votes per share | 1 per director | Shares × directors |
| Allocation flexibility | Fixed per position | Flexible across candidates |
| Minority protection | Weak | Stronger |
| Favours | Majority holders | Minority holders |

**3. Preference (Preferred) Shares**

- Hybrid security with features of both debt and equity.
- **Debt-like:** Fixed periodic payments (dividends), no voting rights.
- **Equity-like:** Perpetual maturity, dividends not a contractual obligation.
- Can be **callable**, **putable**, **convertible**, **participating**, or **non-participating**.

**4. Types of Preference Shares**

- **Cumulative Preferred:**
  - Missed dividends accumulate and must be paid before common dividends.
- **Non-Cumulative Preferred:**
  - Missed dividends do not accumulate.

- Common dividends cannot be paid until current preferred dividend is paid.

- **Participating Preferred:**
  - Receive additional dividends if profits exceed a threshold.
  - Receive more than par value in liquidation.

- **Non-Participating Preferred:**
  - Fixed dividend only; par value claim in liquidation.

- **Convertible Preferred:**
  - Can be converted into common shares at a fixed ratio.
  - Offers fixed income + potential upside if stock price rises.
  - Example: Convertible ratio = 1 preferred $\rightarrow$ 5 common shares.

**5. Example: Preferred Dividend Calculation**

$$\text{Annual Dividend} = \text{Par Value} \times \text{Dividend Rate}$$

Example: \$80 par, 10% dividend rate $\Rightarrow$ \$8 annual dividend.

Exhibit 2: Comparison – Types of Preference Shares

| **Type** | **Dividend Treatment** | **Special Feature** |
|---|---|---|
| Cumulative | Arrears accumulate | Priority over common |
| Non-Cumulative | Missed dividends lost | Paid before common |
| Participating | Extra dividends if profits high | Share in upside |
| Non-Participating | Fixed dividend only | No participation in profits |
| Convertible | Fixed + conversion option | Equity upside potential |
| Callable | Firm can repurchase shares | Flexibility for issuer |
| Putable | Investor can sell back | Downside protection |

**6. Risk and Return Characteristics**

- Preferred shares are **less risky** than common shares:
  - Fixed dividend.
  - Priority in dividends and liquidation.
- Convertible preferred shares provide **upside participation**.
- Common shares provide **highest potential return** but also highest risk.

7. **Application:**

- Convertible and participating preferred shares are common in venture capital and private equity financing.
- Used to compensate investors for higher business risk.

## LOS 44.b: Differences in Voting Rights and Ownership Characteristics Among Equity Classes

1. **Multiple Share Classes**

- Firms may issue multiple classes of common stock (e.g., Class A, Class B).
- Differences include:
  - **Voting power:** Some classes have superior voting rights.
  - **Dividend rights:** Different payout ratios.
  - **Liquidation priority:** One class may have senior claim.

2. **Example:**

- Class A: 1 vote per share.
- Class B: 10 votes per share.
- Founders retain control with smaller ownership.

Exhibit 3: Dual-Class Share Structures

| **Class** | **Voting Rights** | **Notes** |
|---|---|---|
| Class A | 1 vote per share | Common retail class |
| Class B | 10 votes per share | Held by founders/insiders |
| Class C | No vote | Issued to raise capital without diluting control |

3. **Disclosure:**

- Information on share classes and voting rights found in regulatory filings (e.g., SEC in the U.S.).

## LOS 44.c: Comparison of Public and Private Equity Securities

### 1. Public Equity Characteristics

- Traded on organized exchanges or OTC markets.
- **Advantages:**
  - High liquidity and price transparency.
  - Regulated disclosure requirements.
  - Broad investor base.
- **Disadvantages:**
  - Public scrutiny and pressure for short-term results.
  - Higher reporting costs and governance obligations.

### 2. Private Equity Characteristics

- Issued through private placements to institutional or accredited investors.
- **Advantages:**
  - Lower regulatory and reporting costs.
  - Long-term focus without market pressure.
  - Potentially higher returns upon exit (IPO or sale).
- **Disadvantages:**
  - Illiquid—no secondary trading market.
  - Valuation negotiated, not market-determined.
  - Limited disclosure; weaker corporate governance.

Exhibit 4: Comparison – Public vs. Private Equity

| **Aspect** | **Public Equity** | **Private Equity** |
|---|---|---|
| Liquidity | High | Low (no public market) |
| Valuation | Market-determined | Negotiated |
| Disclosure | Extensive (regulatory) | Limited (private) |
| Reporting Costs | High | Low |
| Governance | Strong (public oversight) | Potentially weak |
| Time Horizon | Short- to medium-term | Long-term |
| Expected Return | Moderate | Potentially higher (with risk) |

### 3. Main Types of Private Equity Investments

#### A. Venture Capital (VC)

- Funding early-stage or growth-stage firms.
- **Stages:**
  - **Seed/start-up:** Idea or prototype funding.
  - **Early-stage:** Product development, initial revenue.
  - **Mezzanine:** Expansion financing prior to IPO.
- **Investors:** Angel investors, VC funds, wealthy individuals.
- **Features:**
  - High risk, illiquid, long-term horizon (3–10 years).
  - Returns realized via IPO or acquisition (exit event).

#### B. Leveraged Buyout (LBO)

- Purchase of an entire firm using **debt financing**.
- **Types:**
  - **Management Buyout (MBO):** Existing management acquires the firm.
  - **Management Buy-in (MBI):** External management takes control.
- **Typical Targets:**
  - Firms with stable cash flows (to service debt).
  - Firms with undervalued or sellable assets.

#### C. Private Investment in Public Equity (PIPE)

- Public firm sells shares privately to institutional investors for quick capital.
- Usually at a **discount to market price**.
- **Used by:**
  - Firms in financial distress.
  - Firms seeking strategic investors or bridge financing.

Exhibit 5: Types of Private Equity Investments

| Type | Purpose | Key Characteristics |
|---|---|---|
| Venture Capital | Fund early growth firms | High risk, illiquid, staged financing |
| LBO / MBO | Acquire firm using leverage | Stable cash flow targets, debt-financed |
| PIPE | Inject capital into public firm privately | Discounted share issue, rapid capital access |

**4. Example: Venture Capital Stages and Cash Flow**

Timeline: Seed (0–1 yr) → Early Stage (1–3 yrs) → Mezzanine (3–5 yrs) → Exit (IPO or Sale, 5–10 yrs)

- **Cash Flow Profile:** Negative at start, large positive return at exit.
- **Exit Multiples:** 5×–10× initial investment if successful.

**Summary Insight:**

- Equity securities differ by claim priority, risk, return, and control.
- Preferred shares offer fixed income-like features; common shares offer ownership and voting rights.
- Private equity emphasizes long-term value creation and liquidity trade-offs.

# Module 44.2: Foreign Equities and Equity Risk

## LOS 44.d: Methods for Investing in Non-Domestic Equity Securities

**1. Market Integration and Capital Flow**

- When capital flows freely across borders, markets are said to be **integrated**.
- Global integration has increased due to technology and communication advances.
- Some countries still restrict foreign ownership to:
  - Prevent foreign control of domestic firms.
  - Reduce volatility of capital inflows and outflows.
- Removal of capital barriers ⇒ improved market performance and efficiency.

**2. Firm Perspective on Foreign Listing**

- **Benefits:**
  - Increased visibility and liquidity of shares.
  - Enhanced transparency due to stricter disclosure.
  - Access to a broader investor base and lower cost of capital.

**3. Direct Investing**

- Purchasing foreign company shares directly on foreign exchanges.
- **Challenges:**
  - Currency risk (investment denominated in foreign currency).
  - Market illiquidity.
  - Less stringent reporting standards.
  - Regulatory and procedural differences.

**4. Indirect Investing via Depository Receipts (DRs)**

- **Depository Receipts (DRs):** Certificates representing ownership of foreign shares.
- Issued by a bank which holds the underlying foreign shares.
- Traded in local currency on foreign exchanges.
- Value influenced by:
  - Exchange rate fluctuations.
  - Firm fundamentals and market factors.

**5. Types of Depository Receipts**

- **Sponsored DR:**
  - Firm involved in issuance.
  - Greater disclosure requirements.
  - Investors retain voting rights.
- **Unsponsored DR:**
  - Issued independently by bank.
  - Voting rights retained by bank.
  - Lower disclosure requirements.

Exhibit 1: Comparison – Sponsored vs. Unsponsored DRs

| **Feature** | **Sponsored DR** | **Unsponsored DR** |
|---|---|---|
| Issuer involvement | Yes | No |
| Voting rights | Investor | Depository bank |
| Disclosure standards | High (regulatory) | Low |
| Investor protection | Stronger | Weaker |

### 6. Global Depository Receipts (GDRs)

- Issued outside both the home country and the U.S.
- Typically listed in London or Luxembourg exchanges.
- Denominated in U.S. dollars; accessible to institutional investors.
- **Benefits:**
  - Avoids national capital restrictions.
  - Improves access to foreign capital markets.

### 7. American Depository Receipts (ADRs)

- Denominated in U.S. dollars and traded on U.S. exchanges.
- The underlying security traded in the home market is the **American Depository Share (ADS)**.
- May be used to raise capital or acquire U.S. firms.
- Must comply with SEC regulations.

Exhibit 2: Types of ADRs and Key Characteristics

| Type | Listed/Unlisted | Capital Raising? | Disclosure Level |
|---|---|---|---|
| Level I | OTC (unlisted) | No | Minimal (not SEC-registered) |
| Level II | U.S. exchange | No | Full SEC reporting |
| Level III | U.S. exchange | Yes (new shares) | Full SEC registration and prospectus |
| Rule 144A / Reg S | Private placement | Yes (institutional only) | Exempt from public filing |

### 8. Types of ADRs

### 9. Other Structures

- **Global Registered Shares (GRS):**
  - Same share traded in multiple currencies across exchanges.
  - Equal rights for all holders globally.
- **Basket of Listed Depository Receipts (BLDR):**
  - Exchange-traded fund (ETF) composed of several DRs.
  - Trades like a common stock.

## LOS 44.e: Risk and Return Characteristics of Equity Securities

### 1. Components of Return

$$R_{eq} = \text{Price Change} + \text{Dividends} + \text{Currency Gain/Loss}$$

- For foreign equity, exchange rate movements affect returns.
- Example: A Japanese investor in euro stocks benefits if EUR appreciates vs. JPY.

Exhibit 3: Real Growth of $1 (1900–2016, U.S.)

| **Investment Type** | **Terminal Wealth ($)** |
|---|---|
| Equities (with reinvested dividends) | 1,402 |
| Equities (price-only) | 11.9 |
| Bonds | 9.8 |
| Bills | 2.6 |

### 2. Long-Term Return Illustration

### 3. Risk Hierarchy

- **Preferred stock** less risky than common stock due to:
  - Fixed dividends.
  - Priority in liquidation.
- **Common stock** riskier due to variable dividends and residual claim.

Exhibit 4: Option Features and Relative Risk

| **Feature** | **Effect on Risk** | **Dividend Yield** |
|---|---|---|
| Putable shares | ↓ Risk (downside protection) | Lower yield |
| Callable shares | ↑ Risk (upside capped) | Higher yield |
| Cumulative preferred | ↓ Risk (dividend arrears paid) | Lower yield |
| Non-cumulative preferred | ↑ Risk | Higher yield |

### 4. Option Features and Risk

## LOS 44.f: Role of Equity Securities in Company Financing

**Equity Financing Uses:**

- Funding for long-term assets, expansion, and R&D.
- Provides a non-repayable capital base (unlike debt).
- Enables use of shares as:
  - Acquisition currency.
  - Employee incentive compensation (stock options, RSUs).
- Publicly traded equity enhances:
  - Liquidity.
  - Access to capital markets.
  - Compliance with regulatory capital adequacy ratios.

## LOS 44.g: Market Value vs. Book Value of Equity

**1. Book Value of Equity (Accounting Value)**

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

- Represents cumulative historical capital invested and retained.
- Increases with positive net income and retained earnings.

**2. Market Value of Equity**

$$\text{Market Value} = \text{Share Price} \times \text{Number of Outstanding Shares}$$

- Reflects investor expectations about firm's future performance, risk, and growth.
- Generally $\neq$ book value (market anticipates future cash flows).

**3. Relationship**

- Management aims to increase book value to support higher market value.
- However, book value ignores investor expectations, intangibles, and growth potential.

Exhibit 5: Market Value vs. Book Value Comparison

| Concept | Definition | Key Driver |
|---|---|---|
| Book Value | Historical equity on balance sheet | Retained earnings |
| Market Value | Current share market capitalization | Expected future performance |
| Price-to-Book Ratio | Market / Book | Investor sentiment and growth outlook |

### 4. Key Ratio: Price-to-Book (P/B) or Market-to-Book

$$P/B = \frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$$

- High $P/B \rightarrow$ growth stock (optimistic expectations).
- Low $P/B \rightarrow$ value stock (potential undervaluation).

## LOS 44.h: Cost of Equity, Return on Equity, and Required Return

### 1. Accounting Return on Equity (ROE)

$$ROE = \frac{\text{Net Income available to Common}}{\text{Average Book Value of Common Equity}}$$

Alternative (single-period):

$$ROE = \frac{\text{Net Income}}{\text{Beginning Book Value of Equity}}$$

### 2. Interpretation

- Higher ROE indicates efficient use of shareholders' capital.
- Must evaluate cause:
  - Rising ROE due to lower equity base (share buybacks) is not necessarily positive.
  - Excessive leverage can inflate ROE but raise financial risk.

### 3. Example: ROE and Value Metrics

$$\text{Market Value} = P \times \text{Shares Outstanding}$$

$$\text{Book Value per Share} = \frac{\text{Book Value of Equity}}{\text{Shares Outstanding}}$$

$$\text{Price-to-Book Ratio} = \frac{P}{\text{Book Value per Share}}$$

- Example: Share price = \$16.80, shares = 3,710,000 $\Rightarrow$ Market Value = \$62,328,000.

**4. Cost of Equity (Investor Perspective)**

- The firm's cost of equity = investor's required rate of return.
- Estimated using:

$$k_e = R_f + \beta(R_m - R_f) \quad \text{(CAPM)}$$

  or via Dividend Discount Model:

$$k_e = \frac{D_1}{P_0} + g$$

- Higher cost of equity ⇒ higher required return; lowers intrinsic value.

Exhibit 6: Relationship Between ROE, Cost of Equity, and Required Return

| **Measure** | **Definition** | **Interpretation** |
|---|---|---|
| ROE (Accounting) | Net Income / Avg. Book Equity | Measures profitability based on accounting data |
| Cost of Equity | Required return by investors | Opportunity cost of capital |
| Required Return | Minimum return acceptable to investors | Determines share valuation |

**5. Relationship Summary**

**6. Analytical Insight**

- If $ROE > k_e$: firm adds value; management creating shareholder wealth.
- If $ROE < k_e$: firm destroying value; poor capital allocation.
- $ROE$ volatility indicates riskiness of earnings stream.

**7. Connection with DuPont Decomposition**

$$ROE = \text{Net Profit Margin} \times \text{Asset Turnover} \times \text{Equity Multiplier}$$

- Helps identify drivers of performance: profitability, efficiency, or leverage.

**Summary Insight:**

- Foreign equity exposure adds diversification and currency risk.
- Equity securities vary by control rights, dividend priority, and option features.
- Market value reflects expectations; book value reflects history.
- ROE vs. cost of equity comparison indicates value creation.

# Module 45.1: Company Research Reports

## LOS 45.a: Elements of a Thorough Company Research Report

**Definition:**

- A **company research report** presents an analyst's **valuation** and **investment recommendation** (Buy/Hold/Sell) based on:
  - Projected earnings, cash flows, and financial condition.
  - Market position, competitive dynamics, and risk assessment.

**Purpose:**

- To provide investors with an informed opinion on the intrinsic value and investment potential of a firm.
- Reports can be:
  - **Initial (Initiating Coverage):** Comprehensive, in-depth analysis.
  - **Follow-up Reports:** Updates or revisions to prior analyses.
  - **Internal Reports:** Often less detailed, sometimes verbal.

**1. Structure of an Initial Research Report**

**Example: Summary Table in a Professional Equity Report**

| | |
|---|---|
| **Company:** | $ABCCorporation$ |
| **Sector:** | $ConsumerStaples$ |
| **Recommendation:** | **BUY**$(TargetPrice : \$125, Upside : +20\%)$ |
| **Investment Horizon:** | $12months$ |
| **Key Drivers:** | $VolumegrowthinAsia, productpremiumization, efficiencygains$ |
| **Key Risks:** | $FXvolatility, rawmaterialinflation, competitivepricing$ |

**2. Structure of a Follow-Up (Update) Report**

**3. Legal and Compliance Requirements**

- Disclosure of:
  - Conflicts of interest (analyst holdings, firm banking relationships).
  - Data sources and methodology.
  - Regulatory statements per jurisdiction (e.g., FINRA, FCA, ESMA).

Exhibit 1: Components of an Initial (Full) Research Report

| Section | Description / Contents |
|---|---|
| **Front Matter** | Basic metadata: company name, ticker, analyst name, recommendation (Buy/Hold/Sell), target price range, report date, disclaimers, and legal disclosures. |
| **Investment Thesis & Rationale** | Summary of valuation conclusion and justification — why the stock is attractive or unattractive; include catalysts and valuation drivers. |
| **Company Description** | Business model overview, strategy, revenue sources, geographic segments, management team, and ownership structure. |
| **Industry Overview & Competitive Positioning** | Market size, growth drivers, profitability trends, peer comparison, Porter's Five Forces, and SWOT analysis. |
| **Financial Analysis & Modeling** | Historical and projected income statement, balance sheet, and cash flows; key performance ratios (margin, ROE, ROIC, leverage, liquidity); scenario/sensitivity analysis. |
| **Valuation Section** | Intrinsic (DCF) and/or relative valuation (multiples such as P/E, EV/EBITDA, P/B); compare to target price and peer medians. |
| **ESG Factors** | Environmental, social, and governance risk/opportunity assessment; sustainability metrics and governance quality. |
| **Risks (Upside & Downside)** | Key catalysts that could alter valuation: regulatory, operational, macroeconomic, or competitive factors. Quantify sensitivity to key assumptions. |

Exhibit 2: Components of a Subsequent / Update Report

| Section | Description / Focus |
|---|---|
| **Front Matter** | Updated recommendation, price targets, and disclosure updates. |
| **Revised Recommendation & Rationale** | Reasons for any change (e.g., from Buy → Hold due to valuation or earnings). |
| **New Information Analysis** | Variance analysis: expected vs. actual results (revenues, margins, earnings). Discuss earnings call insights. |
| **Updated Valuation** | Incorporate revised forecasts and adjusted assumptions (e.g., WACC, growth rate). |
| **Revised Risk Assessment** | New risk events since last report: regulatory updates, macroeconomic shifts, management changes. |

## 4. Example Summary: Report Timeline

- **Initiating coverage:** Comprehensive—includes valuation model, full industry analy-

sis.

- **Quarterly updates:** Focused—summarizes performance vs. expectations.
- **Event-driven updates:** Triggered by M&A, regulatory changes, or earnings announcements.

## LOS 45.b: Determining a Company's Business Model

### 1. Definition and Purpose

- A company's **business model** describes how it creates value — i.e., how it earns revenue, generates profit, and manages costs.
- Understanding the business model is fundamental for:
  - Projecting financial performance.
  - Estimating intrinsic value.
  - Identifying competitive advantages and risks.

Exhibit 3: Key Components of a Business Model

| **Component** | **Description / Analytical Focus** |
|---|---|
| Products & Services | What the firm sells; key revenue sources, diversification level. |
| Customers | Who buys the product; customer concentration, bargaining power, switching costs. |
| Sales Channels | How the firm reaches customers (e.g., retail, online, distributors). |
| Pricing & Payment Terms | Revenue model (subscription, volume-based, freemium); pricing power and credit terms. |
| Suppliers & Key Relationships | Supply chain strength, input specialization, supplier concentration and power. |

### 2. Core Components of a Business Model

### 3. Analyst Approach

- Identify deviations from industry-standard business models.
- Evaluate:
  - Barriers to entry and switching costs.
  - Economies of scale and network effects.
  - Integration (vertical/horizontal).

**4. Sources of Information**

- Analysts use four major information categories:

  1. **Company-Provided Information:** Annual/quarterly filings, investor presentations, press releases, IR communication, website.
  2. **Public Third-Party Sources:** Industry reports, government data, media coverage, social media insights.
  3. **Proprietary Third-Party Data:** Subscription databases (e.g., Bloomberg, Refinitiv, FactSet).
  4. **Proprietary Primary Research:** Surveys, expert interviews, channel checks, market studies.

Exhibit 4: Information Source Matrix for Business Model Analysis

| **Source Type** | **Examples** | **Purpose** |
|---|---|---|
| Company Data | 10-K, Investor Decks, Calls | Quantitative details; management intent |
| Public Third-Party | Government, Media, Social Platforms | Industry positioning, sentiment, regulatory context |
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Exhibit 5: Illustrative Business Model Examples

| **Company Type** | **Revenue Model** | **Key Analytical Focus** |
|---|---|---|
| Software-as-a-Service (SaaS) | Subscription-based recurring revenue | Churn rates, customer lifetime value, scalability |
| Retail / E-commerce | Product sales (margin-based) | Inventory turnover, price competition, logistics cost |
| Manufacturing | Unit sales, contract production | Input costs, capacity utilization, supplier risk |
| Financial Services | Interest income, fees, spreads | Asset quality, leverage, regulatory compliance |

**5. Example Analysis: Business Model Comparison**

**6. Analytical Considerations**

- Assess **customer and supplier bargaining power** (Porter's Five Forces).

- Examine whether firm's business model deviates strategically from peers.
- Link business model structure directly to revenue and cost drivers used in valuation.

**Summary Insight:**

- A thorough research report integrates qualitative (business model, industry analysis) and quantitative (valuation, financial modeling) perspectives.
- Understanding the business model allows accurate forecasting of earnings, margins, and capital needs.
- The best reports clearly link business strategy → financial forecasts → valuation recommendation.

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- The best reports clearly link business strategy → financial forecasts → valuation recommendation.

# Module 46.1: Industry Analysis

## LOS 46.a: Purpose and Steps of Industry and Competitive Analysis

### 1. Definition and Objective

- **Industry and competitive analysis** is a macro-level evaluation of what drives:
  - Industry size, profitability, and market share.
  - Competitive dynamics and company positioning within the industry.

- Objective: Identify the **industry's base rate of profitability** and assess how structural and competitive forces affect long-term returns.

## 2. Importance

- Industry factors determine long-run profitability; firm-specific factors explain relative out/underperformance.
- Helps improve financial forecasts and identify attractive or overlooked investments.
- Useful for:
  - Sector allocation in portfolios.
  - Reducing company-specific risk via diversified industry exposure.

## 3. Steps in Industry and Competitive Analysis

1. **Define the Industry:**
   - Identify key characteristics — product type, geographic scope, or production process.
   - Use standard classification systems (GICS, ICB, TRBC).
   - Handle diversified firms carefully.
2. **Survey the Industry:**
   - Assess size, growth rate, profitability trends, and market share evolution.
3. **Analyze Industry Structure (Porter's Five Forces):**
   - Rivalry among existing competitors.
   - Threat of new entrants.
   - Threat of substitutes.
   - Bargaining power of buyers.
   - Bargaining power of suppliers.
4. **Examine External Factors (PESTLE Framework):**
   - Political, Economic, Social, Technological, Legal, Environmental factors.
5. **Evaluate Company Strategies:**
   - Assess competitive advantages and business models relative to peers.
   - Identify cost leadership, differentiation, or niche positioning.

Exhibit 1: Frameworks for Industry and Competitive Analysis

| **Framework** | **Purpose** | **Example Insight** |
|---|---|---|
| Porter's Five Forces | Structure and competition intensity | High entry barriers ⇒ sustainable profits |
| PESTLE | Macro external environment | Regulation or technology shaping demand |
| SWOT | Company-level advantage | Leverage internal strengths against industry trends |

## LOS 46.b: Industry Classification Methods and Comparison

### 1. Overview

- Industry classification helps compare companies, assess trends, and value sectors.
- Traditional systems (government-based) were production-oriented and local.
- Modern commercial systems (GICS, ICB, TRBC) are **global and market-oriented.**

Exhibit 2: Major Global Classification Systems

| **System** | **Developer** | **Hierarchy (Top → Bottom)** | **Coverage** |
|---|---|---|---|
| GICS | S&P / MSCI | Sector → Industry Group → Industry → Subindustry | Public firms |
| ICB | FTSE Russell | Industry → Supersector → Sector → Subsector | Public firms |
| TRBC | Refinitiv | Economic Sector → Business Sector → Industry Group → Industry → Activity | Public & private entities |

### 2. Commercial Classification Systems

### 3. Common Top-Level Sectors (Across GICS, ICB, TRBC) 2

- Energy
- Financials
- Basic Materials
- Information Technology
- Industrials
- Telecommunications
- Consumer Discretionary (Cyclicals)

- Consumer Staples (Noncyclicals)
- Utilities
- Real Estate
- Health Care

**4. Classification Rules**

- A firm with one business line → classified in that line.
- Multi-segment firms → classify by business line contributing:
  - More than 60% of total revenue.
  - If none exceeds 60%, use the one above 50% of revenue, profit, or assets.
  - If none applies → judgmental classification or "conglomerate."

**5. Limitations of Classification Systems**

- **Inappropriate groupings:** Categories too broad (e.g., "software" covers diverse firms).
- **Diversified firms:** One classification may misrepresent operations (e.g., Amazon in "retail" despite large cloud business).
- **Geographical variations:** Some sectors (e.g., healthcare) are regionally restricted.
- **Grouping changes over time:** Updates may distort comparability and create survivorship bias.

**6. Alternative Grouping Approaches**

1. **By Geography:** Classify by headquarter location or primary exchange (e.g., Toyota = Japanese firm despite U.S. revenues).
2. **By Business Cycle Sensitivity:**
   - **Defensive:** Demand stable across cycles (utilities, consumer staples, healthcare).
   - **Cyclical:** Earnings tied to economic activity (industrials, energy, discretionary).
3. **By Financial Characteristics:**
   - Size (market cap), valuation (P/E), profitability (ROE), or growth rate.
   - Example: "Large-cap growth" vs. "small-cap value."
4. **By Statistical Correlation:**
   - Cluster analysis groups firms with historically correlated returns.

- Resulting clusters show lower correlation across groups.

5. **By ESG Attributes:**
   - Group by sustainability or governance quality (e.g., carbon footprint, diversity).

Exhibit 3: Comparison – Cyclical vs. Defensive Industries

| **Feature** | **Cyclical Industry** | **Defensive Industry** |
|---|---|---|
| Demand | Sensitive to economic cycles | Stable across cycles |
| Earnings Volatility | High | Low |
| Operating Leverage | High | Low |
| Examples | Energy, Autos, Industrials | Utilities, Healthcare, Staples |
| Investor Appeal | Growth during expansion | Stability during recession |

## LOS 46.c: Determining Industry Size, Growth, Profitability, and Market Share

### 1. Industry Size

- **Definition:** Total annual sales of the industry's products.
- May differ from total company revenues if firms operate across multiple industries.
- Estimation issues:
  - Private companies and unlisted entities may lack data.
  - Use alternative sources (government, trade associations, market studies).

### 2. Industry Growth Characteristics

- Measured via annual growth rates or compound annual growth rate (CAGR).
- **Types:**
  - **Growth Industry:** High expansion potential, often driven by new technology. Example: renewable energy, AI.
  - **Mature Industry:** Stable demand, aligned with GDP growth. Example: utilities, construction.
  - **Declining Industry:** Falling demand due to substitution or saturation. Example: print media.
- Analysts should evaluate:
  - Persistence of growth.
  - Technological disruption.
  - Business cycle sensitivity.

Exhibit 4: Industry Style Box — Growth vs. Cyclicality

| Type | Business Cycle Sensitivity | Example |
|---|---|---|
| Defensive Growth | Low sensitivity + high growth | Biotechnology |
| Defensive Mature | Low sensitivity + low growth | Utilities |
| Cyclical Growth | High sensitivity + high growth | Digital Advertising, Tech Hardware |
| Cyclical Mature | High sensitivity + low growth | Oil Production, Steel Manufacturing |

### 3. Style Box Framework

### 4. Industry Profitability

- Profitability measured ideally via **Return on Invested Capital (ROIC)**:

$$ROIC = \frac{\text{Net Operating Profit After Tax (NOPAT)}}{\text{Invested Capital}}$$

- Indicates whether firms earn above cost of capital.
- If unavailable (e.g., private firms), use proxy metrics like ROE, EBIT margin, or government/market data.
- Analyze trends: increasing, stable, or declining profitability.

### 5. Market Share and Concentration

- **Market Share:**

$$\text{Market Share} = \frac{\text{Company Revenue}}{\text{Industry Size}}$$

- Market share trends reflect product acceptance and brand competitiveness.
- Acquisitions may distort organic share changes.

### 6. Industry Concentration (Herfindahl–Hirschman Index, HHI)

$$HHI = \sum_{i=1}^{n} s_i^2$$

where $s_i$ = market share (%) of each firm.

Exhibit 5: Interpretation of HHI Values

| HHI Range | Interpretation |
|---|---|
| $< 1{,}500$ | Low concentration (competitive market) |
| 1,500–2,500 | Moderate concentration |
| $> 2{,}500$ | High concentration (oligopolistic market) |

**Example: HHI Calculation**

Market Shares: $35\%, 25\%, 20\%, 10\%, 10\% \Rightarrow HHI = 35^2 + 25^2 + 20^2 + 10^2 + 10^2 = 2{,}450$

- Indicates **moderate concentration**.
- Higher HHI $\Rightarrow$ lower competition, greater pricing power, higher margins.

Exhibit 6: Industry Metrics Summary

| Dimension | High Value Interpretation | Low Value Interpretation |
|---|---|---|
| Industry Growth | Expanding demand, innovation | Saturation, declining relevance |
| ROIC | Value creation above WACC | Value destruction, inefficiency |
| Market Share Trend | Gaining customer acceptance | Losing competitiveness |
| HHI | Concentrated, higher pricing power | Competitive, low pricing power |

**7. Interpretation Summary**

**Summary Insight:**

- Industry analysis links macro factors to firm performance.
- Analysts should integrate:
  - Structural forces (Five Forces),
  - External environment (PESTLE),
  - Financial measures (growth, profitability, concentration).
- The goal: Identify industries with sustainable economic profit potential and companies best positioned within them.

# Module 46.2: Industry Structure and Competitive Positioning

## LOS 46.d: Analyzing Industry Structure and External Influences (Porter's Five Forces & PESTLE Frameworks)

**1. Purpose of Structural Analysis**

- Industry structure analysis explains how competitive forces determine long-run profitability.
- Developed by **Michael Porter**, the framework identifies **five forces** that shape competition.
- Strong forces $\Rightarrow$ lower profitability and potential zero economic profit.

Exhibit 1: Porter's Five Forces Framework

| **Force** | **Key Factors Increasing Strength** | **Impact on Industry Profitability** |
|---|---|---|
| 1. Rivalry Among Existing Competitors | Many equally sized firms, slow growth, high fixed costs, undifferentiated products, costly exit | Intense price competition, reduced margins |
| 2. Threat of New Entrants | Low barriers to entry, low capital needs, easy access to distribution, weak brand loyalty | New competition erodes prices and profits |
| 3. Threat of Substitutes | Many close substitutes, low switching cost, high price elasticity of demand | Price ceiling imposed, reduced pricing power |
| 4. Bargaining Power of Buyers | Few large buyers, high price sensitivity, standardized products, easy comparison shopping | Buyers can force price cuts or better quality |
| 5. Bargaining Power of Suppliers | Few suppliers, scarce inputs, lack of substitutes, supplier integration risk | Higher input costs, margin pressure |

**2. Porter's Five Forces Overview**

**3. Factors Affecting Competition**

- **Barriers to Entry:** Higher barriers reduce competition (e.g., oil refining).
- **Market Concentration:** Few large players ⇒ less rivalry; fragmentation ⇒ high rivalry.
- **Capacity Utilization:** Unused capacity ⇒ price wars (e.g., auto industry).
- **Market Stability:** Customer loyalty stabilizes profits.
- **Customer Price Sensitivity:** High sensitivity ⇒ greater competition.
- **Industry Maturity:** Mature industries = slowing growth, stronger rivalry.

**4. Example – Porter's Five Forces Analysis: U.S. Retail Sector**

**5. PESTLE Framework for External Influences**

- Complements Porter's model by analyzing macro factors outside the industry's direct control.
- PESTLE = **Political, Economic, Social, Technological, Legal, Environmental**.

Exhibit 2: Example—Porter's Analysis for U.S. Retail Industry

| **Force** | **Assessment** | **Explanation / Example** |
|---|---|---|
| Threat of New Entrants | Very High | Easy e-commerce entry, low regulatory barriers, 40,000+ new retailers formed monthly |
| Threat of Substitutes | Low | Limited substitutes for physical goods; services (travel, dining) not direct replacements |
| Power of Buyers | Moderate | Fragmented consumers, but easy price comparison online ⇒ high price sensitivity |
| Power of Suppliers | Low to Moderate | Many suppliers, but brand owners (e.g., luxury goods) hold leverage |
| Rivalry Among Competitors | High | Thousands of similar retailers; price promotions common |

Exhibit 3: PESTLE Analysis – Key Elements and Illustrations

| **Factor** | **Description** | **Example / Industry Impact** |
|---|---|---|
| Political | Government actions, taxation, regulation, subsidies | Energy (fuel taxes, carbon regulation), healthcare (public funding), defense (military budgets) |
| Economic | GDP growth, inflation, interest rates, credit, productivity | Cyclical sectors sensitive to GDP and rates; credit constraints limit consumer spending |
| Social | Demographics, lifestyle, consumer behavior, ethics | Demand for sustainable goods, social media trends, labor attitudes |
| Technological | Innovation pace, automation, disruptive technology | Digitalization, e-commerce, renewable energy, AI, 3D printing |
| Legal | Legislation, labor laws, antitrust, intellectual property | Tobacco restrictions, cannabis legalization, ESG disclosure laws |
| Environmental | Climate policy, resource scarcity, emissions standards | Transition to green energy, carbon taxes, sustainable packaging |

## 6. Example – Sectoral Political Sensitivity

- **Energy:** Conflicts between low energy prices and emission-reduction goals; OPEC price coordination.
- **Healthcare:** Government = largest purchaser; may impose price caps or rationing.
- **Defense:** Governments as sole buyers; budgets depend on geopolitical risk and fiscal priorities.

**7. Example – Technological Disruption**

- **Sustaining Innovation:** Incremental improvements (e.g., higher-efficiency engines).
- **Disruptive Innovation:** Fundamental change creating new markets (e.g., film → digital photography).
- Firms must adapt or risk obsolescence.

## LOS 46.e: Evaluating Competitive Strategy and Position

**1. Overview**

- Every firm follows a **competitive strategy**, intentional or unintentional.
- Effective strategies produce sustained **economic profits (ROIC > WACC)**.
- Strategies are evaluated based on:
  - Responsiveness to competitive forces.
  - Adaptation to external (PESTLE) factors.
  - Execution capability.

**2. Porter's Three Generic Competitive Strategies**

**3. Strategy Effectiveness Criteria**

- Internal consistency and alignment with company resources.
- Responsiveness to Porter's five forces and PESTLE influences.
- Execution capability: management quality, incentives, and innovation.

**4. Intentional vs. Unintentional Strategies**

Exhibit 4: Porter's Generic Strategies

| **Strategy** | **Characteristics** | **Requirements / Examples** |
|---|---|---|
| **Cost Leadership** | Lowest production cost, lowest price; large-scale operations. Used to protect or gain market share. | Efficient operations, economies of scale, strict cost control (e.g., Walmart, Ryanair). |
| **Differentiation** | Unique product features, quality, or brand image; price premium sustainable if justified by value. | Strong marketing, innovation, brand loyalty (e.g., Apple, BMW, LVMH). |
| **Focus (Niche)** | Target specific segment or geography, combining cost or differentiation advantage within niche. | Specialization, deep market understanding (e.g., Ferrari, Rolex, boutique consultancies). |

Exhibit 5: Comparison of Strategic Approaches

| **Type** | **Description** | **Examples / Implications** |
|---|---|---|
| Intentional Strategy | Deliberately planned, iterative (plan $\rightarrow$ execute $\rightarrow$ refine). | Most large firms (e.g., Toyota's Kaizen process). |
| Unintentional Strategy | Emergent, unstructured, reactive. Sometimes yields innovation. | Pharma startups discovering drugs serendipitously. |

## 5. Strategic Risks

- Being "stuck in the middle" — failure to commit to one primary strategy (cost vs. differentiation).
- Inability to sustain cost advantage or premium perception.
- External shocks (technological, legal) invalidating strategy.

## 6. Analytical Application – Evaluating a Firm's Competitive Position

- Combine:
  - **Internal metrics:** ROIC, margins, cost efficiency.
  - **Industry metrics:** Five Forces assessment.
  - **External metrics:** PESTLE exposure.
- Determine if firm's strategy is defensive (protect profits) or offensive (expand market share).

## Key Takeaways Summary

Exhibit 6: LOS 46.d–46.e Summary Overview

| Topic | Core Insights |
|---|---|
| **Porter's Five Forces** | Threat of entrants, substitutes, buyers, suppliers, and competitive rivalry determine long-term industry profitability. |
| **PESTLE Analysis** | Macro factors (Political, Economic, Social, Technological, Legal, Environmental) influence industry trends and risk. |
| **Cost Leadership Strategy** | Achieve lowest production cost; success depends on scale, efficiency, and cost discipline. |
| **Differentiation Strategy** | Provide unique products with sustainable premium pricing justified by perceived value. |
| **Focus Strategy** | Target a specific niche market—combine elements of cost leadership or differentiation. |
| **Strategic Evaluation** | Effective strategy = responsive to Five Forces, resilient to PESTLE, well-executed internally. |

**Overall Insight:**

- Structural analysis (Porter) identifies internal industry pressures.
- Environmental analysis (PESTLE) captures external macro pressures.
- Strategic positioning (cost, differentiation, focus) determines firm performance relative to peers.

# Module 47.1: Forecasting in Company Analysis

## LOS 47.a: Principles and Approaches to Forecasting Financial Results

### 1. Purpose of Forecasting

- Financial forecasts are central to **valuation** and **investment recommendations**.
- External forecasts focus on key metrics (revenue, EPS).
- Internal forecasts are more detailed and long-term.

### 2. Forecast Objects

Exhibit 1: Key Forecast Objects

| Category | Description | Example / Notes |
|---|---|---|
| Financial items with clear drivers | Forecasted via measurable variables | Retail revenue = number of stores × sales/store |
| Items without clear drivers | Forecast directly using management inputs or prior data | "Other expenses" forecasted using past growth trend |
| Summary measures | Aggregated outcomes (EPS, FCF) | Fast but less transparent |
| Ad hoc items | Unusual events, contingencies | Lawsuits, regulatory changes, one-time windfalls |

## 3. Forecasting Principles

- Use information that is **recurring, frequent, and reliable**.
- Avoid unnecessary complexity — more detailed models do not always improve accuracy.
- Focus on material line items.

Exhibit 2: Forecasting Approaches Overview

| Approach | Concept | Best Used For / Limitations |
|---|---|---|
| Historical Results | Extrapolate from past trends | Mature, noncyclical firms; less useful for cyclical or transforming firms |
| Base Rate Convergence | Forecast converges to long-run average (industry or GDP growth) | Established industries with stable structure; not suitable for cyclical or disruptive sectors |
| Management Guidance | Use company-provided forecasts or ranges | Useful if management has strong forecasting record; must check for bias |
| Analyst Discretion | Model-driven or judgmental projections | Suitable for unique, cyclical, or transitioning firms |

## 4. Forecasting Approaches

## 5. Forecast Horizon

- Depends on:
  - Investor time horizon.
  - Industry cyclicality.
  - Duration of strategic changes.

- For cyclical firms: include at least one full business cycle.

## LOS 47.b: Forecasting Company Revenues

### 1. Top-Down Approach

- Begins with macroeconomic variables (GDP growth, inflation, market size).
- Often relates **company sales to nominal GDP**.

$$\text{Revenue Growth} = g_{\text{GDP}} \times (1 + \text{Premium/Discount})$$

- Example: GDP growth = 5%, firm grows 20% faster $\Rightarrow$ $5\% \times 1.20 = 6\%$ forecasted sales growth.
- Alternative: Revenue = Market Share $\times$ Industry Sales

**Example (Market Share Forecast):**

$$\begin{aligned} \text{Current Industry Sales} = 100\text{m GBP}, \quad & \text{Firm Share} = 12\% \Rightarrow 12\text{m GBP} \\ \text{Next Year Industry Sales} = 104\text{m GBP}, \quad & \text{Expected Share} = 13\% \\ \Rightarrow \text{Forecast Revenue} = 0.13 \times 104 = 13.52\text{m GBP} \; & (\uparrow 12.7\%) \end{aligned}$$

### 2. Bottom-Up Approach

- Start from company or segment level.
- Key revenue drivers:
  1. **Price $\times$ Quantity (P$\times$Q)** forecasts.
  2. **Product line / segment analysis.**
  3. **Capacity-based:** forecast sales per store/factory + new capacity.
  4. **Yield-based:** e.g., banks $\rightarrow$ revenue = interest spread $\times$ balance sheet exposure.

### 3. Combined Approach

- Integrate top-down and bottom-up for cross-validation.
- Example: GDP-based forecast vs. company capacity forecast — identify inconsistencies.

### 4. Recurring vs. Nonrecurring Revenue Items

- Exclude one-time or unusual items from recurring forecasts.
- **Nonrecurring items disclosed by management:** e.g., large one-off orders.
- **Undisclosed nonrecurring items:** Analyst identifies via context (e.g., temporary COVID-19 spike in e-commerce).

**5. Forecasting Risks and Scenarios**

- Key risks: competition, inflation, technology, business cycle.
- Use **scenario analysis** to test forecast sensitivity.

## LOS 47.c: Forecasting Operating Expenses and Working Capital

**1. Cost of Sales (COGS) and Gross Margins**

$$\text{Forecast COGS} = (1 - \text{Gross Margin}) \times \text{Forecast Revenue}$$

- Examine trends in **input prices** and **output prices**.
- Analyze gross margin vs. competitors for reasonableness.
- Consider hedging policies on input costs (e.g., oil hedges for airlines).

**Example: Price and Cost Effect on Gross Margin**

$$\text{Initial: } \frac{\text{COGS}}{\text{Sales}} = 25\%, \quad \text{Input Costs Double}, \quad \text{Price} \uparrow 25\%$$

$$\Rightarrow \text{New COGS/Sales} = 40\%, \ \text{Gross Margin} \downarrow \text{from } 75\% \text{ to } 60\%$$

Even if gross profit in absolute terms remains constant, margin compresses.

**2. SG&A Expenses**

- Include fixed (R&D, HQ costs) and variable (sales commissions, logistics) components.
- Model as:

$$\text{SG\&A}_{t+1} = \text{SG\&A}_t \times (1 + g_{\text{inflation}} + g_{\text{volume}})$$

- Segment reporting often limited — analysts use average operating margin by segment.

**3. Working Capital Forecasting**

- Working capital = A/R + Inventory – A/P.
- Use activity ratios to project components:

**4. Analytical Insight**

- A longer cash conversion cycle ⇒ more external financing required.
- Changes in DSO, DOH, and DPO indicate operational efficiency trends.

Exhibit 3: Working Capital Forecasting Ratios

| Item | Ratio | Forecast Formula |
|---|---|---|
| Accounts Receivable | DSO = 365 / Receivables Turnover | A/R = DSO × (Revenue / 365) |
| Inventory | DOH = 365 / Inventory Turnover | Inventory = DOH × (COGS / 365) |
| Accounts Payable | DPO = 365 / Payables Turnover | A/P = DPO × (COGS / 365) |

## LOS 47.d: Forecasting Capital Investments and Capital Structure

### 1. Capital Investments

- Derived from:
  - **Cash Flow Statement:** CapEx acquisitions/disposals.
  - **Income Statement:** Depreciation & Amortization (D&A).
- Separate into:
  - **Maintenance CapEx:** Sustain operations — linked to depreciation, inflation-adjusted.
  - **Growth CapEx:** Supports expansion; based on strategic plans or capacity goals.
- **Depreciation Forecast:**

$$\text{Depreciation} = \frac{\text{Net PPE}}{\text{Useful Life of Assets}}$$

### 2. Capital Structure Forecast

- Assess based on **leverage ratios:**

$$\text{Debt-to-Assets}, \quad \text{Debt-to-Equity}, \quad \text{Interest Coverage}$$

- Incorporate:
  - Debt required for CapEx plans.
  - Management's target leverage or debt covenant limits.

Exhibit 4: Capital Forecasting Summary

| Item | Primary Source | Forecast Driver |
|---|---|---|
| Maintenance CapEx | Historical D&A, inflation rate | Replacement cost of assets |
| Growth CapEx | Strategic plan, capacity expansion | Revenue growth assumptions |
| Capital Structure | Balance sheet, debt covenants | Target leverage, financing needs |

## LOS 47.e: Scenario Analysis in Forecasting

### 1. Definition and Purpose

- Scenario analysis tests sensitivity of forecasts to alternative assumptions.
- Goal: Estimate a **range of potential outcomes** instead of a single point estimate.

### 2. Types of Scenarios

- **Base Case:** Expected macro and company assumptions.
- **Upside Case:** Strong economy, rising margins, favorable competition.
- **Downside Case:** Recession, cost increases, product failure.

Exhibit 5: Scenario Analysis Example

| Scenario | Revenue Growth | Operating Margin | Forecast EPS |
|---|---|---|---|
| Base Case | +5% | 15% | €2.50 |
| Upside Case | +8% | 17% | €3.10 |
| Downside Case | 0% | 12% | €1.85 |

### 3. Example – EPS Sensitivity Table

### 4. Application

- Helps evaluate risk-adjusted valuation.
- Identifies key value drivers (revenues, margins, leverage).
- Often combined with sensitivity analysis and Monte Carlo simulations.

## Key Takeaways Summary

### Overall Insight:

- Sound forecasting integrates macro context, firm-level drivers, and management guidance.
- Analysts should maintain transparency, consistency, and robustness across assumptions.
- Scenario analysis ensures realistic valuation under multiple economic conditions.

Exhibit 6: Module 47.1 Summary Overview

| Learning Objective | Key Insights |
|---|---|
| LOS 47.a | Forecasting requires balancing simplicity, data quality, and key drivers. Use historical, base rate, management, or discretionary methods. |
| LOS 47.b | Revenue forecasts may be top-down (macro-based) or bottom-up (micro-based). Combine both for consistency checks. Exclude nonrecurring items. |
| LOS 47.c | Forecast COGS, SG&A, and working capital using ratios and driver relationships. Gross margin and DSO/DOH/DPO are central. |
| LOS 47.d | CapEx divided into maintenance vs. growth. Capital structure forecasts rely on leverage ratios and target policies. |
| LOS 47.e | Scenario analysis produces a range of forecasts, revealing sensitivity to macro or firm-specific assumptions. |

# Module 48.1: Dividends, Splits, and Repurchases

## LOS 48.a: Determining Overvaluation or Undervaluation

### 1. Concept of Intrinsic Value

- **Intrinsic (Fundamental) Value:** Rational value based on all known characteristics of a security.
- **Market Price:** Observed trading price reflecting current supply and demand.
- Comparison of both determines if a stock is:

$$\text{Market Price}\text{Intrinsic Value} \Rightarrow \text{Overvalued / Undervalued / Fairly Valued.}$$

### 2. Decision Criteria

- The larger the **percentage deviation** between price and intrinsic value $\rightarrow$ greater conviction to act.
- The higher the analyst's **confidence in model and inputs** $\rightarrow$ greater willingness to trade.
- The **sensitivity of the model** to inputs must be checked (e.g., small growth change may change valuation outcome).
- Market prices are generally reliable; mispricing requires a plausible rationale.
- The investor must believe **price convergence** toward intrinsic value will occur within investment horizon.

**3. Example:**

$$\begin{aligned} \text{Intrinsic Value (DCF)} &= \$60 \\ \text{Market Price} &= \$48 \\ \Rightarrow \quad \text{Undervalued by } \frac{60-48}{48} &= 25\% \end{aligned}$$

If analyst confidence is high and a catalyst is expected, **a buy recommendation** is justified.

## LOS 48.b: Major Categories of Equity Valuation Models

Exhibit 1: Categories of Equity Valuation Models

| Model Type | Concept | Example / Key Inputs |
|---|---|---|
| **Discounted Cash Flow (DCF)** | Intrinsic value = PV of expected future cash flows to equity holders | Dividend Discount Model (DDM): $V_0 = \frac{D_1}{r-g}$ Free Cash Flow to Equity (FCFE): PV of cash available after reinvestment and debt service |
| **Multiplier / Market Multiple Models** | Compare firm valuation ratios to peers or market benchmarks | **Type 1:** Price multiples: P/E, P/S, P/B, P/CF **Type 2:** Enterprise multiples: EV/EBITDA, EV/Sales |
| **Asset-Based Models** | Intrinsic value = Fair Value of Assets − Liabilities − Preferred Equity | Useful for asset-heavy firms; adjust book values to market (e.g., real estate, financials) |

**2. Key Notes**

- Analysts often use **multiple models** to derive a valuation range.
- DCF models emphasize long-term fundamentals.
- Multiple models rely on **market comparables**.
- Asset-based models less relevant for firms with large intangibles (tech, pharma).

## LOS 48.c: Types of Dividends, Splits, and Repurchases

**1. Cash Dividends**

- **Regular Dividends:** Paid periodically (e.g., quarterly). Signal stability.
- **Special (Extra) Dividends:** One-time distributions due to exceptional profits.
- Common in cyclical industries (e.g., autos, mining).

**Example:** If firm earns unusually high profit from commodity boom, may pay special dividend while maintaining normal payout ratio in future.

**2. Stock Dividends**

- Paid in the form of additional shares rather than cash.
- Increases number of shares outstanding, reduces per-share price proportionally.
- Total equity and shareholder wealth remain unchanged.

Example: 20% stock dividend $\Rightarrow$ 100 shares $\rightarrow$ 120 shares.

**3. Stock Splits**

- Each share is split into multiple shares.
- Price adjusts downward to maintain total value.

Example: 3:1 split, $P_{\text{before}} = \$90 \Rightarrow P_{\text{after}} = \$30$.

- Used to improve trading liquidity or make shares more affordable.

**4. Reverse Stock Splits**

- Reduces number of shares; price increases proportionally.

Example: 1:5 reverse split, 100 shares at \$2 $\Rightarrow$ 20 shares at \$10.

- Often done to avoid delisting or improve stock image.

**5. Share Repurchases (Buybacks)**

- Company repurchases its own shares from the market.
- **Motives:**
  - Alternative to dividends (tax-efficient if capital gains taxed less than dividends).
  - Support share price or offset dilution (e.g., from employee stock options).
  - Signal undervaluation.
- Reduces shares outstanding $\Rightarrow$ increases EPS and ROE mechanically.

**6. Comparison Summary**

Exhibit 2: Summary of Dividend and Repurchase Types

| **Type** | **Mechanics** | **Effect on Share Price / Equity** | **Example / Note** |
|---|---|---|---|
| Regular Dividend | Periodic cash payment | Stock price drops by approx. dividend amount on ex-date | Quarterly payout (e.g., Coca-Cola) |
| Special Dividend | One-time cash payout | Temporary price increase; no ongoing commitment | Cyclical firms in good years |
| Stock Dividend | Additional shares | Price per share decreases, total equity unchanged | 20% stock dividend |
| Stock Split | More shares at lower price | No wealth change; improves liquidity | 3-for-1 split (Apple, 2020) |
| Reverse Split | Fewer shares at higher price | No wealth change; often cosmetic | 1-for-5 to avoid delisting |
| Share Repurchase | Company buys back shares | EPS and ROE increase; equity reduced | Often substitutes for dividend |

Exhibit 3: Dividend Payment Timeline

| **Date** | **Definition** | **Notes / Example** |
|---|---|---|
| **Declaration Date** | Board approves dividend, announces amount and schedule | Creates legal obligation to pay; e.g., "$1.00 per share declared on June 1." |
| **Ex-Dividend Date** | First day new buyers *do not* receive the dividend | Usually 1–2 business days before record date; stock price drops by dividend amount. |
| **Record Date** | Company determines which shareholders receive dividend | Only holders of record as of this date receive payment. |
| **Payment Date** | Dividend is actually paid (cash or transfer) | Typically weeks after record date. |

## LOS 48.d: Dividend Payment Chronology

### 1. Key Dates and Process

### 2. Example: Dividend Timeline

$$\begin{aligned}\text{Declaration Date} &= \text{June 1, 2025}\\ \text{Ex-Dividend Date} &= \text{June 14, 2025}\\ \text{Record Date} &= \text{June 16, 2025}\\ \text{Payment Date} &= \text{July 1, 2025}\end{aligned}$$

**3. Ex-Dividend Price Adjustment Example**

$$\text{Stock Price Before Ex-Date} = \$25, \quad \text{Dividend} = \$1.00$$

$$\Rightarrow \text{Price After Ex-Date} \approx 25 - 1 = \$24$$

- Buyer before ex-date receives share + dividend.
- Buyer on/after ex-date receives only share.

## Key Takeaways Summary

Exhibit 4: Module 48.1 Summary Overview

| LOS | Core Insights |
|---|---|
| LOS 48.a | Compare intrinsic vs. market value to determine over/undervaluation. Confidence in model and convergence expectation essential. |
| LOS 48.b | Major valuation models: DCF (DDM, FCFE), Multiplier (P/E, EV/EBITDA), and Asset-based. Each has unique use cases. |
| LOS 48.c | Firms distribute profits via dividends (cash/stock), splits, or repurchases. Economic wealth unaffected by splits/dividends, but signaling and tax effects matter. |
| LOS 48.d | Dividend chronology: Declaration → Ex-Date → Record → Payment. Ex-date price drop  dividend amount. |

**Overall Insight:**

- **Valuation** aligns intrinsic and market prices to identify mispricing.
- **Dividends and buybacks** are both methods of cash distribution, differing in taxation, flexibility, and signaling.
- Understanding **timing and type of distributions** is essential for forecasting shareholder returns and price behavior.

# Module 48.2: Dividend Discount Models

## LOS 48.e: Rationale for Present Value Models (DDM & FCFE)

**1. Conceptual Basis**

- The **intrinsic value** of a stock equals the present value (PV) of future cash flows to shareholders.
- PV models assume investors are rational and value equity as the discounted stream of dividends or free cash flows to equity (FCFE).

**2. Dividend Discount Model (DDM)**

- The DDM expresses stock value as:

$$V_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+k_e)^t}$$

  where $D_t$ = dividend in period $t$, and $k_e$ = required return on equity.
- Applicable to firms that pay regular, predictable dividends.

**3. Free Cash Flow to Equity (FCFE) Model**

- FCFE represents the cash available to shareholders after operating, investing, and financing needs:

  $$\text{FCFE} = \text{NI} + \text{Depreciation} - \Delta WC - FCInv - \text{Debt Repayments} + \text{New Debt Issuance}$$

  or

  $$\text{FCFE} = \text{CFO} - FCInv + \text{Net Borrowing}$$
- FCFE models are particularly useful for firms:
  - That do not pay dividends.
  - Where dividends are not reflective of earning capacity.

**4. Required Return Estimation (CAPM)**

$$k_e = R_f + \beta_i[E(R_m) - R_f]$$

- $R_f$: risk-free rate (e.g., government bond).
- $\beta_i$: stock's systematic risk.
- $E(R_m) - R_f$: market risk premium.

**Alternative Approach:**

- If firm debt is publicly traded: $k_e$ = Bond Yield + Equity Risk Premium
- If not: add a larger premium to government yield.

## LOS 48.g: Valuation of Preferred Stock

### 1. Characteristics

- Fixed dividend, perpetual duration, non-callable and non-convertible (in this context).
- Essentially a perpetuity with fixed cash flow.

### 2. Formula

$$V_p = \frac{D_p}{k_p}$$

**Example: Preferred Stock Valuation**

$$D_p = \$5, \quad k_p = 8\%$$

$$V_p = \frac{5}{0.08} = \$62.50$$

**Interpretation:**

- Value equals the present value of perpetual dividends discounted at required return.
- Equivalent to DDM with zero growth ($g = 0$).

## LOS 48.h: Constant and Multistage Growth Dividend Discount Models

### 1. Constant Growth (Gordon Growth) Model

- Assumes dividends grow perpetually at constant rate $g_c$.
- Formula:

$$V_0 = \frac{D_1}{k_e - g_c}$$

- Assumptions:
  1. Dividends are relevant measure of shareholder wealth.
  2. Growth rate $g_c$ and required return $k_e$ remain constant.
  3. $k_e > g_c$.

**Example: Constant Growth Valuation**

$$D_0 = 1.50, \quad g_c = 8\%, \quad k_e = 12\%$$

$$D_1 = D_0(1 + g_c) = 1.62$$

$$V_0 = \frac{1.62}{0.12 - 0.08} = \$40.50$$

**2. Decomposition of Value due to Growth**

$$V_{\text{no growth}} = \frac{D}{k_e} = \frac{1.50}{0.12} = 12.50$$

$$V_{\text{growth}} = 40.50 - 12.50 = 28.00$$

$\rightarrow$ Growth accounts for $\approx 69\%$ of intrinsic value.

**3. Sensitivity Insight**

- As $(k_e - g_c)$ narrows, $V_0$ increases sharply.
- Small changes in $g_c$ or $k_e$ cause large valuation shifts.

**4. Estimating Dividend Growth Rate**

1. Historical average dividend growth.
2. Median industry dividend growth.
3. **Sustainable Growth Rate:**

$$g = (1 - \text{Payout Ratio}) \times ROE$$

or

$$g = \text{Retention Rate} \times ROE$$

**Example: Sustainable Growth**

$$\text{Payout} = 25\%, \quad ROE = 21\% \Rightarrow g = (1 - 0.25)(0.21) = 15.75\%$$

**Note:** Long-term growth usually limited to single digits; check realism.

## LOS 48.h (continued): Firms with No Current Dividends

**1. Approach**

- Estimate when dividends will start.
- Use constant growth model to value dividends starting from that year, then discount back.

**Example: No Current Dividend**

$$E_4 = 1.64, \quad \text{Payout} = 50\%, \quad g = 5\%, \quad k_e = 10\%$$

$$D_4 = 0.5 \times 1.64 = 0.82$$

$$V_3 = \frac{D_4}{k_e - g} = \frac{0.82}{0.10 - 0.05} = 16.40$$

$$V_0 = \frac{16.40}{(1.10)^3} = 12.32$$

**Interpretation:** Stock value today equals PV of future dividends beginning in Year 4.

## LOS 48.h (continued): Multistage Dividend Discount Model

### 1. Rationale

- Firms often experience a temporary high-growth phase before stabilizing.
- The multistage model incorporates both phases:

$$V_0 = \sum_{t=1}^{n} \frac{D_t}{(1+k_e)^t} + \frac{P_n}{(1+k_e)^n}$$

where

$$P_n = \frac{D_{n+1}}{k_e - g_c}$$

### 2. Example: Two-Stage Growth

$$D_0 = 1.00, \quad g^* = 15\% \text{ for 2 years}, \quad g_c = 5\%, \quad k_e = 11\%$$

$$D_1 = 1.00(1.15) = 1.15, \quad D_2 = 1.15(1.15) = 1.32$$

$$P_1 = \frac{D_2}{k_e - g_c} = \frac{1.32}{0.11 - 0.05} = 22.00$$

$$V_0 = \frac{D_1 + P_1}{(1.11)} = \frac{1.15 + 22.00}{1.11} = 20.86$$

$$V_0 = 20.86 \text{ (approx.)}$$

### 3. Key Steps for Multistage Model

1. Determine discount rate $k_e$.
2. Estimate dividend growth rate during high-growth period $g^*$.
3. Project dividends during high-growth phase.
4. Estimate stable growth rate $g_c$ after transition.
5. Compute terminal value $P_n = D_{n+1}/(k_e - g_c)$.
6. Discount all cash flows to present value.

### 4. Common Mistakes

- Forgetting to discount the terminal value $P_n$ correctly.
- Using wrong time index (e.g., discounting over too many periods).

## LOS 48.i: Applicability of Constant vs. Multistage Models

**1. Constant Growth (Gordon) Model Appropriate for:**

- Mature, stable, non-cyclical firms with predictable dividend policies.
- Examples: Utilities, consumer staples.

**2. Multistage Growth Model Appropriate for:**

- Firms with temporary high or low growth transitioning to stability.
- Firms in cyclical or rapidly evolving industries.
- Can include 2- or 3-stage variants:
  - **Stage 1:** High growth.
  - **Stage 2:** Transition (moderating growth).
  - **Stage 3:** Constant, stable growth.

**3. When to Use FCFE Models Instead**

- When dividends are non-existent or unpredictable.
- When payout policy does not reflect earnings capacity.
- FCFE model applies if earnings and reinvestment assumptions are available.

## Key Takeaways Summary

Exhibit 1: Module 48.2 Summary Overview

| LOS | Core Insights |
|---|---|
| 48.e | PV models (DDM, FCFE) value equity by discounting future cash flows to shareholders. FCFE reflects potential dividends. |
| 48.g | Preferred stock = fixed dividend perpetuity: $V_p = D_p/k_p$. |
| 48.h | Gordon Growth Model: $V_0 = D_1/(k_e - g_c)$. Use for stable, dividend-paying firms. Growth and discount rate differences highly sensitive. |
| 48.h (2-stage) | Multistage DDM combines finite high-growth and infinite stable-growth phases. Requires accurate growth transition assumptions. |
| 48.i | Constant-growth model fits mature firms; multistage fits firms in transition; FCFE models suit non-dividend-paying firms. |

**Overall Insight:**

- Dividend and FCFE models both rest on the time value of money principle.
- Choice of model depends on dividend policy, growth stage, and data availability.
- Key valuation drivers: $k_e$, $g$, payout ratio, and ROE.

# Module 48.3: Relative Valuation Measures

## LOS 48.j: Rationale for Using Price Multiples

### 1. Motivation for Price Multiples

- Because DDMs are highly sensitive to input assumptions, analysts often use **price multiples** as simpler, market-based valuation tools.
- A **price multiple** compares a company's market price to a financial metric (earnings, sales, book value, cash flow).

### 2. Common Multiples

- Price-to-Earnings (P/E)
- Price-to-Sales (P/S)
- Price-to-Book Value (P/B)
- Price-to-Cash Flow (P/CF)

### 3. Advantages

- Easily calculated and widely published.
- Useful for **time-series (historical)** and **cross-sectional (peer)** comparison.
- Empirical evidence: low multiples often predict higher future returns.

### 4. Drawbacks

- Historical ("trailing") data may not reflect future performance.
- Forecast ("forward") data may vary by analyst and cause inconsistency.
- Requires consistency across firms in metric definitions.

**5. Types of Multiple-Based Valuation**

- **Multiples Based on Comparables (Market-Based):**
  - Compare firm's multiples to peers or industry average.
  - Reflects "law of one price": similar assets should trade at similar multiples.
- **Multiples Based on Fundamentals:**
  - Derived from valuation models (e.g., DDM, FCFE) → **justified** multiples.
  - Reflect what multiples *should be* based on fundamentals ($D_1$, $E_1$, $k$, $g$).

## LOS 48.k: Calculation and Interpretation of Price Multiples

Exhibit 1: Key Price Multiples

| Multiple | Formula | Interpretation |
|---|---|---|
| P/E | $P$/EPS | Indicates how much investors pay per \$1 of earnings. |
| P/S | $P$/(Sales per share) | Useful when earnings are negative; less affected by accounting policies. |
| P/B | $P$/(Book value per share) | Indicates market valuation relative to accounting book value; $> 1$ implies future profitability. |
| P/CF | $P$/(Cash flow per share) | Cash-based measure less prone to earnings manipulation. |

**1. Common Price Multiples and Formulas**

**2. Fundamental (Justified) P/E from Gordon Growth Model**

$$V_0 = \frac{D_1}{k-g}$$
$$\Rightarrow \frac{P_0}{E_1} = \frac{D_1/E_1}{k-g} = \frac{\text{Payout Ratio}}{k-g}$$

**Example:**

$$\text{Payout Ratio} = 30\%, \quad k = 13\%, \quad g = 6\%$$
$$\text{Justified P/E} = \frac{0.3}{0.13 - 0.06} = 4.3$$

**Interpretation:**

- If actual P/E = 8 → Overvalued (market ¿ justified value).
- If actual P/E = 2 → Undervalued (market ¡ justified value).

**3. P/E Sensitivity:**

- Increases with higher payout ratio or higher growth.
- Decreases with higher required return $k$.
- **Dividend Displacement of Earnings:** Higher payout $\Rightarrow$ lower retention $\Rightarrow$ lower sustainable growth.

**Example: Holt Industries**

- Higher payout and higher growth $\rightarrow$ higher P/E justified.
- Higher leverage $\rightarrow$ higher risk $\rightarrow$ higher $k$ $\rightarrow$ lower P/E justified.

**4. Multiples Based on Comparables (Comps)**

- **Law of One Price:** Similar assets should trade at similar multiples.
- **Benchmarks:**
  - Historical average (time-series).
  - Industry or peer group (cross-sectional).
- Must ensure comparability:
  - Similar size, leverage, growth, accounting policies.
  - Cyclicality: use P/S instead of P/E when earnings fluctuate.

**Example: Renee's Bakery**

- P/E higher, but P/S, P/B, P/CF lower than peers.
- Suggests potential undervaluation.
- Downward trend in multiples $\rightarrow$ possible undervaluation vs. own history.

Exhibit 2: Example Multiples Comparison (Renee's Bakery vs. Industry)

| **Ratio** | **Renee's Bakery** | **Industry Avg.** |
|---|---|---|
| P/E | 15 | 12 |
| P/CF | 5 | 7 |
| P/S | 1.0 | 1.5 |
| P/B | 1.2 | 1.6 |

**Example Table: Interpretation:** Lower multiples except P/E $\rightarrow$ potentially undervalued; check if earnings depressed.

## LOS 48.l: Enterprise Value (EV) Multiples

### 1. Concept

$$EV = \text{Market Value of Equity} + \text{Market Value of Debt} + \text{Preferred Equity} - \text{Cash}$$

- Represents total firm value, not just equity value.
- Adjusts for differences in capital structure.
- Used to compare firms regardless of leverage.

Exhibit 3: Common EV Multiples

| Multiple | Formula | Use / Advantage |
|---|---|---|
| EV/EBITDA | $\frac{EV}{EBITDA}$ | Most common; ignores capital structure, tax, and non-cash items. |
| EV/EBIT | $\frac{EV}{EBIT}$ | Compares total firm value to operating earnings. |
| EV/Sales | $\frac{EV}{Sales}$ | Useful for early-stage or negative-earnings firms. |

### 2. Common Ratios

**Example: EV/EBITDA**

$$\text{Equity Value} = 40 \times 200,000 = 8,000,000$$

$$\text{Debt} = 600,000 + 1,200,000 = 1,800,000, \quad \text{Cash} = 250,000$$

$$EV = 8,000,000 + 1,800,000 - 250,000 = 9,550,000$$

$$\text{EBITDA} = 1,000,000 \Rightarrow \text{EV/EBITDA} = 9.55$$

**Interpretation:**

- If industry average = 11 $\rightarrow$ undervalued.
- If industry average = 8 $\rightarrow$ overvalued.

### 3. Notes:

- Market value of debt may need estimation (use bond market data or book values).
- Use EV multiples when:
  - Comparing firms with different leverage.
  - Earnings are negative (P/E not meaningful).

## LOS 48.m: Asset-Based Valuation Models

**1. Concept**

$$V_{Equity} = V_{Assets} - V_{Liabilities}$$

- Based on market (fair) value of assets and liabilities.
- Reflects "floor" or liquidation value.

**2. When Appropriate**

- Firms with primarily tangible, short-term, or marketable assets.
- Financial institutions, real estate, or natural resource firms.
- Liquidation or distressed valuations.

**3. Example: Williams Optical**

$$\text{Assets (adjusted)} = 10{,}000 + 20{,}000 + 50{,}000 + 120{,}000(1.20) = 224{,}000$$

$$\text{Liabilities} = 5{,}000 + 30{,}000 + 45{,}000 = 80{,}000$$

$$\text{Equity Value} = 224{,}000 - 80{,}000 = 144{,}000$$

$$\text{Shares} = 2{,}000 \Rightarrow \text{Per Share Value} = 72$$

**4. Limitations**

- Market values of assets/liabilities may be hard to obtain.
- Intangibles (brand, customer base) not captured.
- Inflation and accounting conventions distort book values.

## LOS 48.f: Advantages and Disadvantages of Valuation Models

## Key Takeaways Summary

- **Price Multiples** provide quick, market-based assessments of relative valuation.
- **Fundamental Multiples** (e.g., justified P/E) link valuation directly to growth, payout, and required return.
- **Enterprise Value Multiples** adjust for leverage and are robust when earnings are negative.
- **Asset-Based Models** give conservative, floor-level estimates.
- Always apply multiple methods and test sensitivity across scenarios.

Exhibit 4: Comparative Overview of Valuation Models

| **Model Type** | **Advantages** | **Disadvantages** |
|---|---|---|
| **Discounted Cash Flow (DCF)** | - Based on fundamental PV theory.<br>- Widely accepted and theoretically sound. | - Requires subjective input estimates.<br>- Highly sensitive to small input changes. |
| **Price Multiples (Comparables)** | - Empirical support for return prediction.<br>- Easy to compute, available, intuitive.<br>- Allows time-series and peer comparison. | - May mix firms of different growth/risk.<br>- Affected by accounting differences.<br>- Cyclical distortions possible.<br>- Negative denominators invalid (e.g., negative EPS). |
| **Price Multiples (Fundamentals)** | - Grounded in valuation models.<br>- Highlights relation to payout, growth, and return. | - Extremely sensitive to $(k - g)$ inputs. |
| **EV Multiples** | - Independent of capital structure.<br>- Useful when earnings are negative. | - Requires market value of debt (often estimated).<br>- EBITDA may include non-cash items. |
| **Asset-Based Models** | - Provide floor values.<br>- Reliable for tangible-asset firms or liquidation. | - Hard to estimate market values.<br>- Poor for intangible-heavy firms.<br>- Misleading under inflation. |