

- Overview of equity securities
- Introduction to industry and component analysis
- Equity Valuation: Concepts and Basic tools

## Overview of equity securities

### Common shares

- benefits
  - residual claim
  - voting
    - proxy if unable to attend the annual meeting
- voting
  - **statutory** voting: one share for one candidate
  - **cumulative** voting: allocate votes to one or more
    - good for minority
- option
  - callable
    - repurchase if stock price increase
  - puttable
    - sell to company when price drop
    - sold for **higher** price

### Preferred Stock

- stock
  - similar to common: dividend not a **contractual**
  - similar to debt: make **fixed** periodic payment and no voting
- cumulative 以前的损失（未支付的 dividend）
  - cumulative preferred share
    - promised fixed dividend, **unpaid** dividend should be paid before common share holders
  - **non-cumulative**
    - dividends are not accumulated
- participating 新的盈利
  - participating 多余盈利和多余价值
    - receive extra dividend if **profits** exceed a threshold
    - receive extra value (>par) if firm is **liquidated**
  - **non-participating**
    - no share of profits
    - claim=par in liquidation
- Convertible
  - Convert to common share
  - Advantages
    - Dividend > common dividend
    - Less risk than common share: stable dividend and priority in liquidation
  - When to convert
    - **Profitable**, then convert to common stock

- Conversion option **valuable** when stock price increase
- Purpose
  - Financial risky **venture capital** and PE

### Stock Class

- Different classes: class A and class B
- Higher
  - Greater voting power (more ownership)
  - Seniority in liquidation
  - Different in dividend, stock splits, other

### Private equity

- Characteristic
  - Less **liquidity** 流动性不好
  - **Negotiated** share price
  - **Limited** financial disclosure
  - **Less** reporting costs
  - **Weaker** corporate governance
  - Greater ability to focus on **long-term** 关注长期
  - Greater **return** once goes public
- Types
  - Venture capital
    - Early in capital: development and growth
    - Start-up, early state, mezzanine financing
    - Illiquid: three-to-ten years
  - Leveraged buyouts (LBO)
    - Buy **equity** share using **debt** financing
    - Have **cash flow** that is adequate to service debt 高现金流
    - Or have **undervalued asset** that can be sold to pay debt 低估致残
    - MBO (buyer is the current management)
  - Private investment in public equity (PIPE)
    - Public firm needs **capital quickly** sell private equity to investors
    - Have **growth** chances, in **distress**, or large amount of **debt** 增长
    - Buy stock at a sizeable **discount** to its market price 折扣

### Non-domestic equity securities

- Listing in foreign exchange
  - Increase publicity, liquidity, transparency
- **Direct investment** in foreign companies 直接投资
  - Buy firm securities in foreign market
  - Arbitrage and currency risk exposure
  - Obstacles
    - Denominated in **foreign** currency
    - Foreign stock exchange may be **illiquid**
    - Reporting may be less strict
    - Must be familiar with regulations and procedures

- **Depository receipts (DRs)**
  - **Ownership** in a foreign firm and are **traded** in market of other countries in **local** market currencies
  - Bank **deposits** shares and issue **receipts** of ownership
  - Depository bank
    - Custodian and manage dividend, splits
  - No need to convert, but still be affected by exchange rate
  - **Sponsored DR**
    - Firms is involved, **investor** has **voting** rights
  - **Un-sponsored DR**
    - **Bank** retain voting
- **Global depository receipts (GDR)**
  - Issued **outside** US and outside home country
  - Denominated in US
  - **Not subject to capital flow imposed by government**
  - Trade on London and Luxembourg exchange
- **American depository receipts (ADRs)**
  - Denominated in US and trade in US
  - Based on American depository share (ADS)
  - Trade in domestic market
  - Can raise capital in US and acquire other firms
    - Most register in SEC, but some can be privately placed
  - Level 3 can raise capital with high listing fee

	Level I	Level II	Level III	Rule 144A
<b>Stock Exchange</b>	Over-the-counter (OTC) Markets	NYSE NASDAQ AMEX	NYSE NASDAQ AMEX	Private Equity
<b>SEC Registration</b>	Required	Required	Required	Not required
<b>If Permit Fundraising in US</b>	No	No	Yes	No
<b>Listing cost</b>	Low	Higher	Highest	low

- 
- **Global registered shares (GRS)**
  - Trade in different **currencies** on stock exchange around the world
- **Basket of listed depository receipts (BLDR)**
  - ETF that is collection of DRs
  - Trade like common stock

## Risk and Return

- Price change, dividend, gains & losses in currency exchange
- Reinvestment of dividend
- Preferred stock less risky than common, so lower return
- Risky
- Preferred < common
- Cumulative < non-cumulative
- Puttable (lower dividend) < callable (higher dividend)

### Roles

- Purchase
- Buy
- compensation
- liquidity

### Book and market value

- Book: asset – liability, balance sheet
  - Net income and retained earning
- Market
  - Outstanding shares (expectation of future performance)

### ROE

- Accounting return on equity (ROE)
  - ROE = net income / **average** equity
    - Book value is volatile
  - Or  $ROE_t = \frac{NI_t}{BV_{t-1}}$ 
    - Stable
- Price-to-book/ market-to-book
  - Lower: value, higher: growth (成长股, 被高估)

### Cost of equity

- Cost of equity
  - **minimum** rate of return required by investor
  - Expected equilibrium total return on its share market
- Dividend-discount or CAPM
- Share price decrease -> increase **expected** return -> decrease intrinsic value

## Introduction to industry and component analysis

### Importance

- Framework for understanding firm
- Understand business environment
  - Firm potential growth, competition, and risk
- Active management
  - Identify undervalued or overvalued industries to weight them
  - Industry rotation: based on business cycle
- Performance attribution analysis
  - Source of return relative to benchmark

### Classification system

- Base on **products and services** 基于产品和服务
  - By a firm's principal business activity (sale earnings)
- Sector: a group of similar industries
- Based on **business cycle**: cyclical and non-cyclical 经济周期
- Statistical approach: clustering (correlation)

### Commercial classification

- Basic materials and processing
- Customer discretionary: cyclical 周期性
  - Automotive, apparel, hotels and restaurants
- **Customer staples**: less cyclical 非周期性
  - Food, beverage, tobacco, **personal care**
- Energy, financial, technology, health care,
- Telecommunications, utilities

### Government classification

- Make comparisons constant across time and country 一致性
- Weakness
  - No **constituent** firms 没有组成公司
  - Update **less** frequently (a few years) 更新慢
  - No **distinguish** between small & large, for-profit and not-for-profit firms, private and public firms
- Limitation
  - Two firms in the same **narrowest** industry cannot be used as **peer** groups

### Cyclical and non-cyclical (defensive, and growth)

- Firm (周期和非周期)
  - Cyclical: depend on stage of business 周期
    - High earnings volatility and operating leverage
  - Non-cyclical: demand is stable over business cycle 非周期
    - **health care, utilities, telecommunications, consumer staples**
- Sectors
  - Cyclical: energy, financial, technology, material, consumer discretionary

- Non-cyclical: health care, consumer staples, utilities
- Non-cyclical
  - Defensive 防御性
    - Least affected by stage of business cycle
    - Utilities, consumer staples, basic service
    - May not always safe investment: grocery
    - May contain truly defensive and some growth firms
  - Growth 成长型
    - Demand so **strong** they are largely **unaffected** by stage
    - Earn higher returns than WACC, low dividend-payout ratios
    - 盈利高, 分红少

### Stocks

- Defensive
  - Do not decline or decline less than the market
  - Small positive or negative beta
- Growth
  - Rapid growth and sales, high P/E and P/B 高股价, 高估
- Value
  - Undervalued, low P/E, and P/B 低股价, 低估

### Peer group

- A set of similar companies used for valuation
  - Similar business activity, demand drivers, cost structure, availability of capital
  - Minimize the effects of finance subsidiaries
  - difficult to have the same valuation
- Process
  - Commercial classification system: starting point
  - Identify companies in the same industry
  - Check key **competitors** in annual reports
  - Other competitors of competitors

### Industry analysis

- Strategic group
- Life-cycle state: embryonic, growth, shakeout, mature, declining
- **Experience** curve
  - cost per unit relative to output 单位产出的代价
  - **Decline** because of productivity, high **fixed** costs 随着产能下降
- **Factors: GES, TMD**
- **Forces:**

### Strategic analysis - five forces

- **Forward** looking
- Rivalry among existing **competitors**
  - Slow growth
- Threat of **entry**

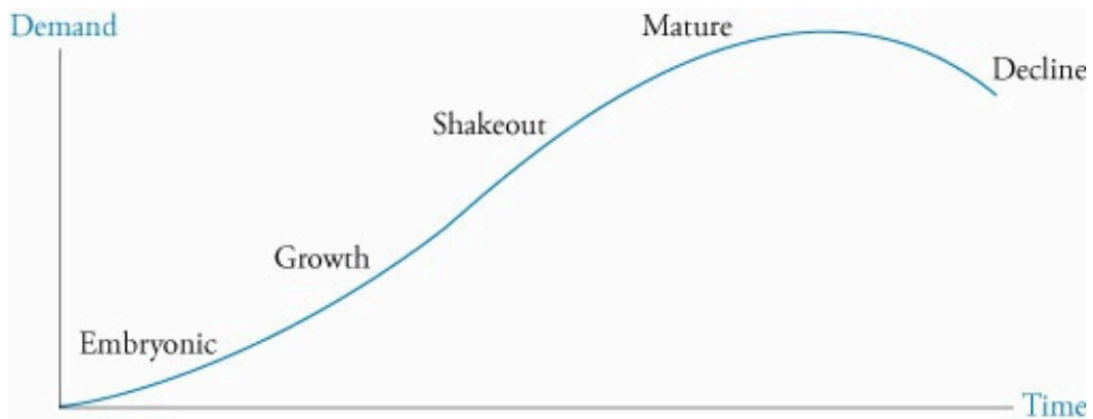
- Large barriers -> easy to maintain premium pricing
- Threat of **substitutes**
  - Limit the profit potential (increasing the elasticity of demand)
  - Commodity-like: high competition and low profit margins
  - More differentiated -> less competition
- Power of **buyers**
  - Ability to bargain for lower prices or higher quality -> profitability
- Power of **suppliers**
  - Raise price or limit supply
  - A few: high pricing power

### Pricing power and competition

- Overall
  - **High** barriers -> reduce competition
  - Greater **concentration** -> reduce competition
  - Market fragmentation -> increase competition
  - Unused capacity -> intensive price competition
  - **Stable** market share -> reduce competition
  - More price **sensitivity** of customer -> greater competition
- Barriers to entry
  - Examine composition of the industry
  - Capital, intellectual, attractive to customer
  - High barrier -> does not mean pricing power
  - Lower barrier -> does not ensure success
  - Greater easy of entry -> decrease pricing power
  - Greater easy of exit -> increase pricing power 容易退出->增加竞争力
- Industry **concentration**
  - **Relative** market share matter than **absolute** share
  - With greater differentiation: greater pricing power
  - Capital intensive: costly to enter or exit, overcapacity -> intense
  - High concentrated with good pricing power
    - Tobacco, alcohol, confection
  - High concentrated with low pricing power -> high barrier to **exists**
    - Aircraft, automobile, oil refining
  - Concentration no guarantee pricing power, but a fragmented market result in strong competition.
- Industry **capacity** (impact pricing power) 产能
  - **Clear** impact on pricing power
  - under capacity, supply lower -> high pricing power
  - overcapacity, supply more -> low pricing power
  - capacity is fixed in the short run and variable in the long run
  - not necessary physical: insurance
  - **non-physical** capacity -> can be reallocated more quickly
- market share stability
  - **stable** -> less competition
  - **unstable** market share-> highly competitive
  - factors: new products and innovations, increase **switching costs**

- **slow** pace of product innovation -> **stable**
- **high switching cost** -> lower competition -> stable

## Industry life cycle



- Embryonic (slow)
  - **Slow** growth, **high** prices, **large** investment, high risk of failure
- Growth (fast speed)
  - **Rapid** growth, **falling** prices, increasing **profitability**, **limited** competitive pressure, low barrier to entry
  - **Less pricing wars**
- Shakeout (slow speed) 减少成本
  - Growth has slowed, **declining** profitability
  - Increased **overcapacity**, intensive **competition**
  - Increased **cost cutting**, increased failure
- Mature (slow) 价格稳定, 寡头
  - **Slow** growth, **stable** pricing
  - **consolidate** (oligopoly), high barriers
  - superior firms gain market share
- Decline (negative) 价格下降, 退出
  - **Negative** growth, **declining** prices, consolidation (exit or merge)
- Strategy
  - Growth 关注规模
    - Reinvest, increase economies of scale, build brand loyalty
  - Mature 关注成本
    - Focus on **cost** efficiency (large demand from replacement)
    - Pay out cash to investors

## External factors

- Macroeconomic
  - Cyclical and structural trend
  - GDP, interest rate, credit availability, inflation
  - Education level
- Demographic



- Age population and population size, change in composition
- Technological
  - New products: computer software, photography
- Governmental
  - Tax, regulation
- Social
  - Work, play, spend
  - Women entered workforce

### Company analysis

- Financial condition, products & services, competitive strategy

### competitive strategy

- defensive or offensive
- cost leadership (low-cost) - defensive
  - low cost, **high** volume
  - managerial incentives promote **operational** efficiency
  - predatory pricing
    - drive out competitors and increase prices later
  - defensive pricing
    - when competitive environment is low rivalry
- product or service **differentiation** strategy – offensive
  - differ in type, quality, delivery
  - **sustainable** over time
  - spend more on market **research** teams and **creative** personnel

### spreadsheet modeling

- analyze fundamental
- complexity can make conclusion seem precise

## Equity Valuation: Concepts and Basic tools

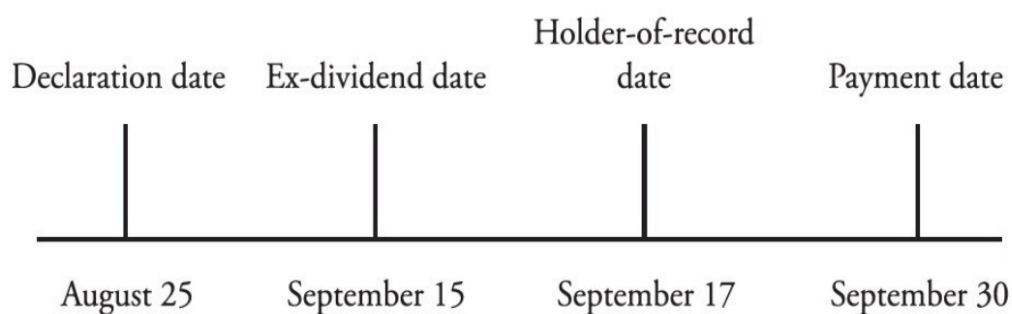
### Methods

- discounted cash flow 现金流
  - cash dividend 现金分红
  - free cash flow 自由现金流
- market multiplier
  - Price-fundamental 价格基本面
    - price to sales, **earnings**, book value, cash flow
    - Low multiple -> higher return
    - Price - Market or model
      - Fundamental: based on **valuation** model (i.e, Gordon)
      - Comparable: based on **market** prices
  - Enterprise value 收购企业
    - $EV = \text{debt \& equity (common \& preferred)} - \text{cash} - \text{short-term investment}$
    - EBIDA or revenue
- Asset-based 普通取价值
  - Common stock = asset – liability – preferred stock

### Dividend

- Cash dividend
  - Reduce market and company value
  - Regularly
  - Irregular/special/extra
- Stock dividend
  - Total wealth unchanged
- Stock split
  - Total wealth unchanged
- Stock merge/reverse stock spit
  - Total wealth unchanged
- Share purchase
  - Similar to cash dividend

### Dividend payment



- Declaration date
  - BOD approves. The amount, **record** and **payment** date
- Ex-dividend date 交易所确定

- **First** day that share purchase will not receive next dividend 当天不再分红
- **One or two business days** before the record date
- Set by the exchange
- Price will decrease 价格下降
- Holder-of-record 登记
  - Owners receive dividend payment
- Payment 支付 (可能是周末)
  - Payment is made
  - No need to be a business day

## DDM

- DDM
  - $PV = \sum_t \frac{D_t}{(1+k)^t}$
- One-year holding period DDM
  - $PV = \frac{D}{1+k} + \frac{P_1}{1+k}$
- Multiple-year holding DDM
  - $PV = \sum_{i=1}^t \frac{D_i}{(1+k)^i} + \frac{P_t}{(1+k)^t}$
  - $P_t$  is the selling price immediately **after** dividend  $D_t$  is paid
- FCEE
  - $FCEE = \text{cash flow from operation} - FCInv + \text{net borrowing}$
  - $FCEE = \text{net income} + \text{depreciation} - \text{increase in working capital} - \text{fixed capital investment (FCInv)} - \text{debt principal repayment} + \text{new debt issue}$
  - $PV = \sum_t \frac{FCEE_t}{(1+k)^t}$
- Required rate for equity
  - CAPM
    - $k_e = R_F + \beta \times (R_M - R_F)$
  - Form firms with publicly traded debt
    - $k_e = \text{current bond yield} + \text{premium}$
    - $k_e = \text{government bond yield} + \text{premium}$

## DDM - Preferred stock (non-callable, non-convertible)

- Fixed and indefinite
- $PV = \sum_t \frac{D}{(1+k_p)^t} = \frac{D}{k_p}$
- If one-year maturity and semi-annual compounding
  - $PV = \frac{D_1}{1+\frac{k_p}{2}} + \frac{D_2}{\left(1+\frac{k_p}{2}\right)^2} + \frac{P_2}{\left(1+\frac{k_p}{2}\right)^2}$

## DDM - Gordon/constant growth model

- Dividend growth at  $g_c$ , next dividend is  $D_1 = D_0 \times (1 + g_c)$ 
  - $D_0$  the dividend paid in the last year
- $PV = \sum_t \frac{D_0(1+g_c)^t}{(1+k_e)^t} = \sum_t D_0 \left( \frac{1+g_c}{1+k_e} \right)^t = D_0 \times \frac{1+g_c}{k_e - g_c} = \frac{D_1}{k_e - g_c}$
- Assumption

- Dividend growth rate and required return on stock are never change
- Dividend
  - Dividend are measure of shareholder wealth
  - Forever, infinitely, indefinitely
  - Just paid, recently paid, last dividend  $\rightarrow D_0$
  - Will pay or is expected to pay  $\rightarrow D_1$
- Contribution of dividend growth?
  - Value – value (assume no growth)
  - Dividend contribution  $= \frac{D_1}{k_e - g_c} - \frac{D_0}{k_e}$
- Growth rate in dividend
  - Historical growth
  - Median industry dividend
  - Sustainable growth rate (earning/equity/dividend can continue to grow)
    - **sustainable growth rate = ROE  $\times$  retention rate = ROE  $\times$  (1 – dividend pay out ratio)**
- Timing and amount of first dividend payment
  - Example
    - Year 4 start to pay, earning is 1.64, main payout ratio 50%
    - Expected dividend pay is  $D_4 = 1.54 \times 0.5 = 0.82$
    - $P_3 = D_4 / (k - g) = 0.82 / (0.1 - 0.05) = 16.4$
    - $V_0 = P_3 / 1.1^3 = 12.32$

### Multistage dividend discount model

- assume dividend at  $t+1$  and beyond grow at constant rate
  - $PV = \sum_{i=1}^t \frac{D_i}{(1+k)^i} + \frac{P_t}{(1+k)^t}$ 
    - $P_t = \frac{D_{t+1}}{k_e - g_c}$  is the terminal stock value
      - Discounted value of future cash flow starts from  $t+1$
- Dividend
  - The dividend at  $t$  is  $D_t$ , the dividend at  $t + 1$  is  $D_{t+1} = D_t \times (1 + g_c)$
  - The PV at  $t$  is  $P_t = \frac{D_{t+1}}{k_e - g_c}$
  - The PV at  $t - 1$  is 再向前折现一年
    - $P_{t-1} = \frac{D_t}{1+k_e} + \frac{D_t \times (1+g_c)}{(k_e - g_c)(1+k_e)} = \frac{D_t}{1+k_e} \left( 1 + \frac{1+g_c}{k_e - g_c} \right) = \frac{D_t}{k_e - g_c}$
- 如果第一年底是  $D_1$ , 第二年底  $D_1 \times (1 + g)$ , 第三年底是  $D_1 \times (1 + g)^2$ 
  - 第二年初的现值是  $D_1 \times \frac{1+g}{k-g}$
  - 第一年初的现值是  $\frac{D_1}{k-g}$

### Gordon

- Single constant
  - **Stable and mature, non-cyclical**, dividend-paying
- Two-stage
  - High current growth, will drop to a stable rate in the future
  - Growing slowing or get smaller, growth is expected to stabilize

- **Three-stage**
  - Initial high growth, lower growth, constant growth
  - **Yong firm** still in high growth phase

### Discounted Cash flow Choices

- Does not pay dividends, future dividend cannot be estimated reliability -> FCFE as long as growth rate of **earnings** can be estimated
- Otherwise, use price **multiples**

### Price multiple

- Prices Multiples (Lower -> high return)
  - Price-to-earnings (P/E): most widely used
  - Price-to-sales (P/S)
  - Price-to-book value (P/B): book value of equity per share
  - Price-to-cash flow (P/CF)
    - Operating or free cash flow
- Prices
  - Comparable: based on **market** prices
    - Cons: reflect past historical data
    - Solution: use forward in denominator
  - Fundamental: based on **valuation** model
- Fundamental
  - $P_0 = \frac{D_1}{k-g}$  Justified P/E (assume correct input, sensitive to input)
  - Leading P/E
    - $\frac{P_0}{E_1} = \frac{D_1/E_1}{k-g} = \frac{1-retention}{k-g}$  (divided by next year's earning)
    - Used as benchmark
  - Trailing P/E
    - $\frac{P_0}{E_0} = \frac{D_1/E_0}{k-g} = \frac{\frac{D_0}{E_0} \times (1+g)}{k-g} = \frac{(1-retention) \times (1+g)}{k-g} = \frac{P_0}{E_1} \times (1+g)$
  - Increase dividend payout ratio -> reduce sustainable growth rate
  - Dividend **displacement** of earnings
    - High dividend -> increase value
    - High dividend -> reduce growth rate -> reduce value
  - Props
    - Theoretically sound valuation model
    - Widely accepted value metrics
  - Cons
    - Sensitive to input (k-g)
- Comparable
  - Time series: historical average
  - Cross-sectional: stock/industry average
  - Cyclical firm: P/E sensitive, use P/S
  - Cons
    - Lagging price reflect the past
    - Across firms with different size, products, growth
    - Cyclical firms affected by economic conditions

- Different from **fundamental**
  - Different **accounting** methods
  - **Negative** denominator meaningless
- P/E
  - Cyclical firm: P/S
  - High P/E because of high expense -> P/EBITDA

### Enterprise value

- What it takes to acquire the firm: pay the debt and equity, get the liquid
  - *$EV = \text{equity (common \& preferred)} + \text{debt} - \text{cash} - \text{short term investment}$*
- Props
  - **Independent** of capital structure or earnings are negative and P/E cannot be used 和资本结构无关
  - Useful for **capital-intensive** 资本密集型
- EBITDA - **denominator**
  - Better than net income: because it is always **positive**
  - Disadvantage: often include **non-cash** revenue and expense
  - Operating income can also be used
- Debt
  - Problem: no **market** value
  - Use market value of similar bonds or **book** value

### Asset-based (market value)

- *$\text{equity} = \text{market or fair value of asset} - \text{market or fair value of liability}$*
- Props
  - Provide **floor**/minimal values
  - Reliable for firms
    - with **tangible short-term** asset 固定短期资产
    - ready **market** values (financial or natural resource firms) 市值可靠
    - **cease** to operate and is being **liquidated** 停业或者清算
  - used value **private** firms and now for public firms with **fair value** reporting
- Cons
  - Market value are difficult to decide 市值难以确定
  - Market differ from book value
  - Difficult during **hyper-inflation** 恶性通货膨胀
  - Inaccurate when large **intangible** assets 无形资产不准确
    - Effect of loss of owner's talents and customer relation on forward earning hard to measure
    - use as minimum value
    - supplement it with forward-looking valuation, discounted cash flow