



23年CFA一级 学霸笔记

核心考点深度总结，打基础+二轮复习必看

178页精华汇总，23年重难点解析。

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注：标黄章节为23年重要考点

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Quantitative Methods

Module 1 The time value of the money ☆☆☆

Required interest rate on a security = risk-free rate
+ Expected inflation rate
+ Default risk premium
+ Liquidity risk premium
+ Maturity risk premium

Effective annual rate = $(1 + \text{periodic rate})^m - 1$

Ordinary annuities (普通年金)

Annuities due (先付年金), 与普通年金相比, PV 和 FV 均较大

The PV annuity function on the calculator set in "END" mode gives you the value one period before the annuity begins.

如果有两步计算, 两步中的年数之和应和题目中对应

Loan amortization schedule:

Ending balance = Beginning balance - Principle Component

To draw a time line is a very good way to start.

Module 2 Organizing, Visualizing, and Describing Data

Descriptive statistics: 描述性统计量

Inferential statistics: 统计学统计量

The interval with the greatest frequency is referred to as the **modal interval**.

一个 distribution 只有一个众数的时候, 称作 unimodal; 当由两个或以上的时候, 称作 bimodal or trimodal

The formula for the position of the observation at a given percentile, y , with n data points sorted in ascending order is:

$$L_y = (n+1) * y/100$$

计算器计算 standard deviation 的时候, S_x 意味着 sample 的标准差 (分母上是 $n - 1$), σ_x 意味着 population 的标准差

A Positive skew has many outliers in the right tail. It is said to be skewed right because of its relatively long right tail.

The lognormal distribution is truncated at zero and skewed to the right.

Negative skew

Skewness affects the mean more than the median and mode, and the mean is “pulled” in the direction of the skew.

Leptokurtic 尖峰,更多回报率接近均值,也有更多离均值更远,风险增加
Platykurtic 平峰

Excess kurtosis indicates much more frequent returns at the extremes, both positive and negative than for a normal distribution. In general, **greater positive kurtosis and more negative skew** in return distributions indicates increased risk.

Regarding means, typically harmonic mean < geometric mean < arithmetic, unless data are same.

几何平均> 对过去收益的总结
算术平均> 对未来收益的预期

Module 3 Probability Concepts☆☆☆

Objective probabilities: **prior probability** is determined using a formal reasoning and inspection process; **empirical probability** is established by analyzing past data.

Subjective probability: **least formal method** of developing probabilities and involves the use of personal judgment.

Consider an event that has a probability of occurrence of 0.125, which is one-eighth. The odds that the event will occur are 1/7.

$Cov(R_i, R_j) = E\{[E_i - E(E_i)][R_j - E(R_j)]\}$ 若有概率的话再相乘

The variance and standard deviation measure the dispersion, or volatility, of only one variable. Covariance is a measure of how two assets move together. Properties of correlation of two random variables:

- 1) Correlation measures the strength of the linear relationship between two random variables.
- 2) Correlation has no units.
- 3) If correlation is 0, means no linear relationship, but there may other relationship exists.

凡是遇到贝叶斯公式的情况,全部用树形图来解决.

贝叶斯公式: $P(A|B) = \frac{P(AB)}{P(B)} = \frac{P(B|A)}{P(B)} * P(A)$

Module 4 Common Probability Distribution

判断是否为概率函数: $0 \leq p(x) \leq 1, \sum p(x) = 1$

Cumulative distribution function (CDF) for a random variable, X , may be expressed as $F(x) = P(X \leq x)$

A binomial random (**discrete distribution**) variable for which the number of trials is 1 is called a Bernoulli random variable.

Expected value $X = E(X) = np$

Variance of $X = np(1 - p)$

Multivariate distributions between two discrete random variables are described using joint probability tables. Correlation is the feature that distinguishes a multivariate distribution from a univariate normal distribution. Correlation indicates the strength of the linear relationship between a pair of random variables.

The 68% confidence level interval for X is $X \pm S$ (约 1 个标准差)

The 90% confidence level interval for X is $X \pm 1.65S$

The 95% confidence level interval for X is $X \pm 1.96S$ (约 2 个标准差)

The 99% confidence level interval for X is $X \pm 2.58S$ (约 3 个标准差)

对于标准正太分布,第一步是计算 z 值, 第二步查表

Z value represents the number of standard deviation a given observation is from

the population mean. $Z = \frac{x - \mu}{\sigma}$

Lognormal has two features: positive skew; the price is bounded from below by zero.

Safety-first ratio = $\frac{E(R_p) - R_f}{\sigma_p}$, shortfall probability 可以通过查表求得

Module 5 Sampling and Estimation☆☆☆

In stratified random sampling (分层随机抽样), one divides the population into subpopulations and randomly samples from within the subpopulations.

- 1) Time-series data consists of observations taken over a period of time at specific and equally spaced time intervals.
- 2) Cross-sectional data are a sample of observations taken at a single point in time.

3) Longitudinal data (纵向数据) are observations over time of multiple characteristics of the same entity, 比如十年的某个国家的 GDP, inflation rate 等

4) Panel data (面板数据) contain observations over time of the same characteristic for multiple entities, 比如十年的 20 个公司的 debt/equity ratio.

Central limit theorem 中心极限定理:

只要 sample size > 30, 那么这个样本就可以看作正态分布;

样本和总体的均值相等, 样本的标准差 = $\frac{\sigma^2}{n}$ (a是总体的标准差)

Standard error of the sample mean = 总体的标准差 / \sqrt{n}

但是一般来说, 总体的标准差都未知, 所以用样本的标准差来代替.

Three desirable properties of estimators:

- 1) unbiased-ness (样本估计接近总体估计)
- 2) efficiency (方差比其他估计值都小)
- 3) consistency (样本越多, 越精确)

学生 t 分布的特点:

对称; 只由自由度决定; 肥尾, 自由度越大越尖瘦, 越接近正态分布; 也就是说 自由度增加会减少置信度区间.

因为肥尾在相同的置信度下 t 分布往往比正态分布有更宽的置信度区间. 也就是说, t 分布比正态分布更难拒绝原假设.

An increase in the reliability factor (the degree of confidence) increases the width of the confidence interval. Increasing the sample size and increasing the degrees of freedom both shrink the confidence interval. (由公式得知)

置信度区间 = $\bar{x} \pm z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

Criteria for selecting the appropriate test statistics:

When sampling from a (以下均指样本):	Small sample (n<30)	Large sample (n>30)
Normal dist with known variance	Z-statistics	Z-statistics
Normal dist with unknown variance	t-statistics	t-statistics
Nonnormal dist with known variance	N/A	Z-statistics
Nonnormal dist with unknown variance	N/A	t-statistics

4) 盯住 unknown variance, 用 t 分布; 若为 known variance, 用 Z 分布.
如果总体方差已知的话, 用 Z test; 如果总体方差未知, 但是样本 $n < 30$, 并且知道正态分布, 则 t test;
如果总体方差未知, 但是样本 $n > 30$, 则 Z test 和 t test(更倾向)都可以;

The critical z value is $Z = \frac{x - \mu}{\sigma / \sqrt{n}}$

- 1) Data mining bias 如果一直用相同的数据作研究则会产生.
征兆: 如果你假设了很多变量, 那么你总会找到某些规律, 产生 bias
避免办法: 使用样本外数据来检验结论的合理性; 试图找到经济理论的支持。
- 2) Sample selection bias 样本选择不随机, 比如在计算组合收益的时候, 排除了 退市的股票;
- 3) Survivorship bias
- 4) Look-ahead bias 前视偏差, 要使用的数据不是在同一天采得. 研究组合收益时 使用每年年末的会计结果, 真实情况是这些结果通常在年末之后几周才公布.
- 5) Time-period bias 时间段短, 则结论可能不能广泛试用; 时间段长, 则关系可能发生变化, 要分成两个时间段分开研究.

Module 6 Hypothesis Testing☆☆☆

The null hypothesis is the hypothesis that the researcher wants to reject. The null hypothesis always includes the "equal to" condition.

Test statistics = (sample statistics - hypothesized value) / Standard error of the sample statistics

Type I error: 拒绝真 (significance level = probability of Type I error)

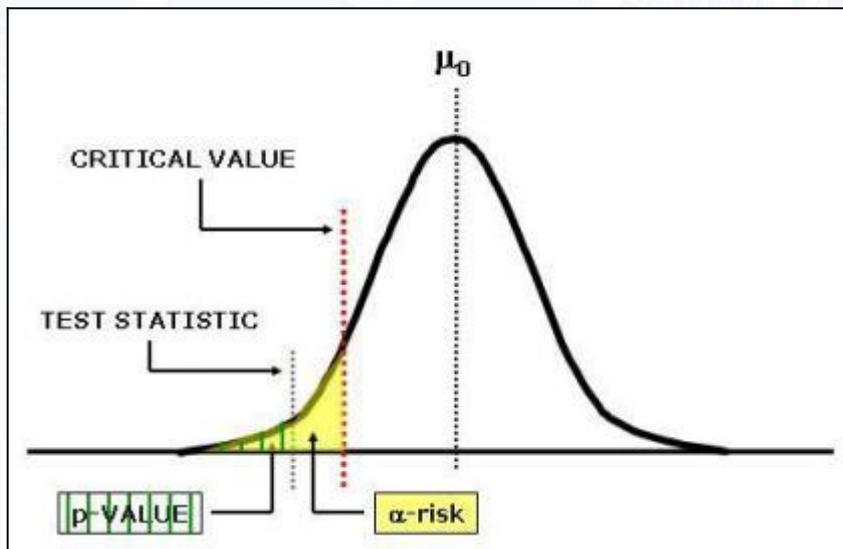
Type II error: 接受假 (Power of test = 1 - probability of Type II error) 记忆方式: 按照真假字眼出现的顺序分一二.

Usually, $P(\text{Type I error})$ increases, then $P(\text{Type II error})$ decreases. If you want them both to decrease, you need to increase the sample size.

The P-value is the probability of obtaining a test statistics that would lead to a rejection of the null hypothesis, assuming the null hypothesis is true.

The P-value is the smallest level of significance at which the null hypothesis can be rejected. The smaller the p-value the stronger the evidence against the null hypothesis. P-values close to zero

strongly suggest that the null hypothesis should be rejected. P 值越接近 0, 越应该拒绝原假设



1) There are two t-tests that are used to test differences between the means of two populations. (The differences in means test)

1.1) 两种测试的共同点: samples are **independent**; populations are normally distributed(前面两个是这种 t test 成立的必要条件); population variance is unknown.

1.2) 两种测试的不同点: 一种是合并样本方差(自由度 = $N_1 + N_2 - 2$) **assume the population variances are equal**, and the sample observations are pooled. 另一 种则没有方差相等这个假设.

2) Paired comparisons (t test): requires the sample data be normally distributed; samples are **dependent**. (T statistics is the average difference in paired observations divided by the standard error of the differences between observations)

Nonparametric alternatives to parametric tests

	Parametric	Nonparametric
Test concerning a single mean	t-test, z-test	Wilcoxon signed-rank test
Tests concerning differences between means	t-test	Mann-Whitney U test
Test concerning mean differences (paired comparison tests)	t-test	Wilcoxon signed-rank test

3) Chi-square test 用来检验正态分布的方差是否等于某值. $\chi^2_{n-1} = \frac{(n-1)s^2}{\sigma^2}$
 (S 是样本方差, σ 是需要检验的值.)

4) F 分布用来检验两个独立的正态分布是否有相同的方差. $F = \frac{s_1^2}{s_2^2}$ 大的值
 放在分子, **拒绝域总在右边**. Degree of freedom: n-1.

Parametric tests rely on assumptions regarding the distribution of the population and are specific to population parameters.

Nonparametric tests are only used when the data are not suitable for parametric tests.

Nonparametric tests are primarily concerned with ranks, signs, or groups, and they are used when numerical parameters are not known or do not meet assumptions about distributions. Even if the underlying distribution is unknown, parametric tests can be used on numerical data if the sample is large.

Examples: small size sample comes from a non-normal distribution; data are ranks rather than values; runs test, to determine whether data are random.

The Spearman rank correlation test can be used when the data are not normally distributed.

Economics

Module 1 Topics in Demand and Supply Analysis☆☆☆

Types of markets

- 1) Factors of production (factor markets)
- 2) Services and finished goods (goods market or product markets)
- 3) Intermediate goods

An increase in the price of A will decrease demand for B (they are complements 互补品);

An increase in the price of A will increase demand for B (they are substitutes 替代品).

$Q_s = -55 + 26P_s + 1.3P_a$ 在这个供给公式中,系数为 1.3,所以 a 是 s 的替代品; 如果 a 的价格上升,则 s 的销量增加,供给曲线右移.

Law of demand: the fact that quantity demanded typically increases at lower prices.

Law of supply: the fact that a greater quantity is supplied at higher prices.

Demand/supply curve: 横轴是 Q,纵轴是 P.

Shifts and movements along demand and supply curve:

- 1) Changes in price does not result in a shift of the curve
- 2) Changes in demand or supply will result in a shift of the curve

Partial equilibrium: take the factors that may influence demand as fixed except for the price

General equilibrium: relationships between the quantity demanded of the good and factors that may influence demand are taken into account.

价格偏离均衡, 若价格回复, 则 **stable equilibrium**; 反之, 则为 **unstable**.

- 1) common value auction 共同价值拍卖

Oil lease auctions: The bidder who most overestimates the value of a lease will be the highest bidder. This is sometimes referred to as the winner's curse.

- 2) private value auction 私人价值
拍卖 Auction of art or collectibles

- 1) ascending price auction/English auction 增价拍卖
- 2) sealed bid auction 密封报价拍卖

The term reservation price refers to the highest price that a bidder is willing to pay. 针对每个人来说的

- 3) second price sealed bid auction/Vickrey auction 次高价密封报价

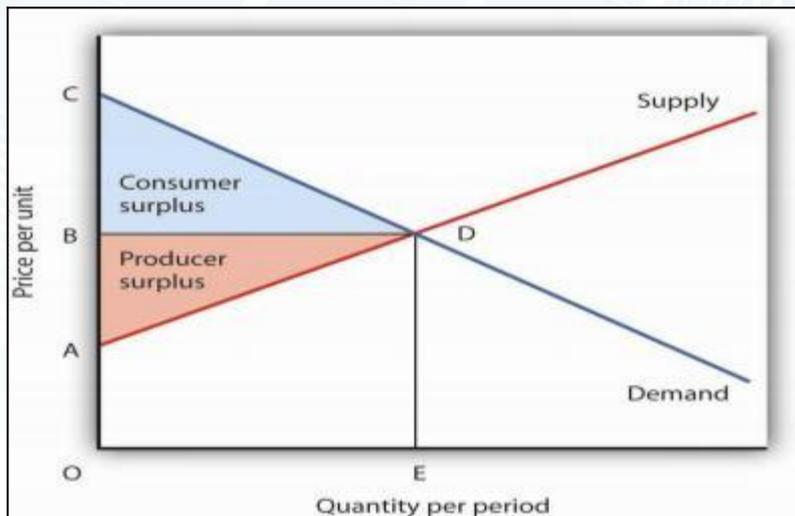
There is no reason for a bidder to bid less than his reservation price. The eventual outcome is much like that of (1).

- 4) descending price auction/**Dutch auction** 降价拍卖

If first bidder agrees to buy three of ten units at \$100, subsequent bidders will get the remaining units at lower prices. 有时候每个人最后价格均为最低 价,最划算.

With US treasury securities, a single price auction is held but bidders may also submit a **noncompetitive bid**. Such a bid indicates that those bidders will accept the amount of treasuries indicated at the price determined by the auction.

Figure: Consumer/producer Surplus



We assume that the demand curve represents the marginal social benefit curve; the supply curve represents the marginal social cost curve.

Producer surplus = revenue – variable costs

Deadweight loss: the reduction in consumer and producer surplus due to underproduction or overproduction.

DWL 是相比于理想情况亏了多少，从 p 和 q 考虑。

Obstacles to the efficient allocation of productive resources

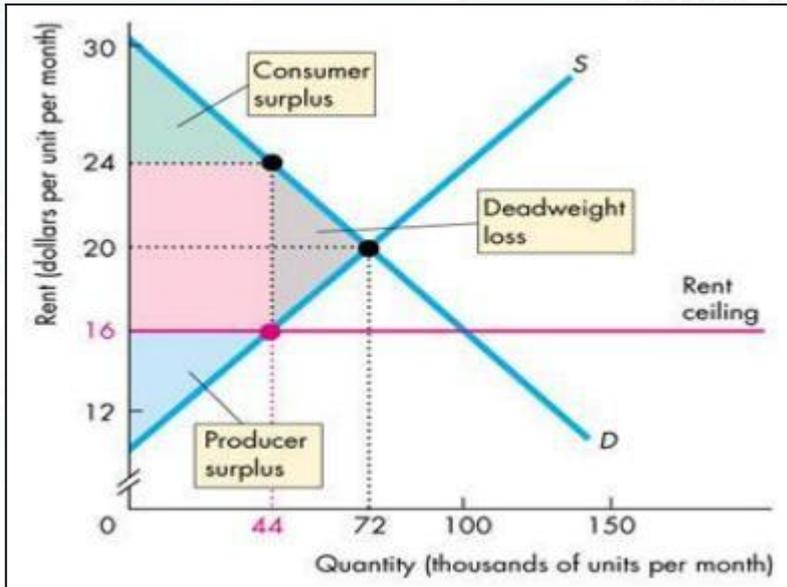
1) Price controls

1.1) Price ceiling (造成 underproduction)

If the ceiling is above the equilibrium, it will have no effect.

If it is below the equilibrium price, please see below. Producers often respond by reducing the quality of goods.

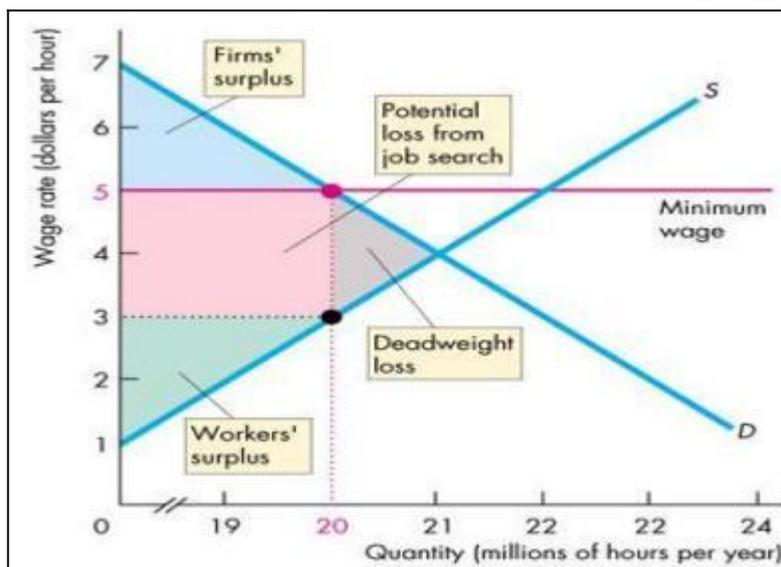
纵轴 16-20 的正方形部分，本来属于 producer surplus，有了 price ceiling，变为 consumer surplus。



1.2) Price floor (造成 overproduction)

If the floor is below the equilibrium, it will have no effect.

If it is above the equilibrium price, please see below.



2) tax and trade restrictions, such as subsidies(导致产量过大) and quotas (导致 产量过小)

2.1) Tax

the actual tax incidence (实际归宿) is independent of whether the government imposes the tax (statutory incidence 名义归宿) on consumers or suppliers.

Tax 将s 曲线向上推, 将 d 曲线向下推。

直线越陡, 弹性越差, 承担的税负越多。

As the elasticity of either demand or supply decreases, the DWL is also reduced. (DWL 的产生都是因为没有达到最优产量)

The trade price should be the same whether the tax is imposed on the buyer or on the seller.

2.2) Subsidies and Quotas

subsidies 补贴给厂家会造成 supply curve 向右平行移动.

Producers often seek the imposition of quotas because at the quota amount, marginal benefit exceeds marginal cost.

- 3) external costs (产量过大), 对外部副作用却不用支付, 加大生产;
- 4) external benefits(产量过低), 对外部正效应却没好处, 减少生产;
- 5) Public goods(产量过少, free rider) and common resources. (捕鱼, 产量过度)

1) Price Elasticity of Demand 需求(x)的价格(y)弹性。

所谓弹性, 即需求随价格变化的敏感度。

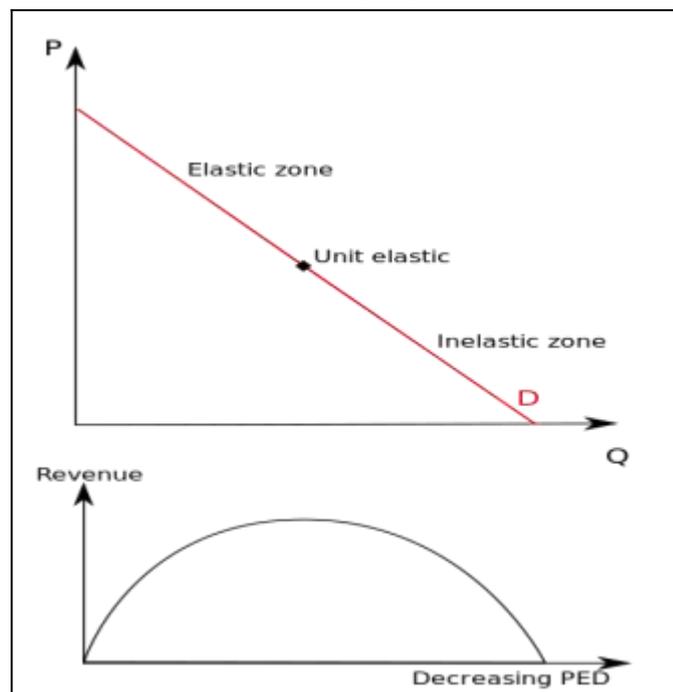
1.1) 完全弹性需求, 价格变化极度影响需求(有替代品的时候)

A product's demand is elastic if demand increases by a greater percentage than the percentage price cut when prices are cut.

1.2) 完全无弹性需求, 价格变化不影响需求(无替代品的时候)

需求弹性并非需求曲线的斜率,

unit elastic 的时候, total revenue 最大, 如下图:



1.3) Other factors affect demand elasticity

1.3.1) Portion of income spent on a good. 价格越高, 弹性越大(性大, 即为会考虑选择要或者不要某一商品)

1.3.2) Time 调整时间越大, 表明弹性越大

1.4) Calculation (若 >1 , 则为elastic; 若 <1 , 则为inelastic)

$$\frac{\% \Delta Q}{\% \Delta P} = \frac{\Delta Q / ((Q_1 + Q_2) / 2)}{\Delta P / ((P_1 + P_2) / 2)}$$

2) Income Elasticity of Demand 需求(x)的收入(y)弹性

2.1) **Normal goods**: an increase in income leads to an increase in quantity demanded.

2.2) **Inferior goods**: an increase in income leads to a decrease in quantity demanded.

3) Cross Price Elasticity of Demand (需求的交叉价格弹性)

The rate of the percentage change in the quantity demanded of a good to the percentage change in the price of a related good.

3.1) **Substitutes**: when an increase in the price of a related good increases

demand for a good, we say the two goods are substitutes(正的需求的交叉价格弹性).

3.2) **Complements**: when an increase in the price of a related good

decreases demand for a good, we say the two goods are complements(负的需求的交叉价格弹性).

3.3) Overall, the price elasticity of demand is more positive the better

substitute two good are and more negative the better complements the two good are.

公式: $\frac{\% \Delta Q}{\% \Delta P} = \frac{\Delta Q / Q}{\Delta P / P} = \frac{P}{Q} * \left(\frac{\Delta Q}{\Delta P} \right)$ 其中 $\frac{\Delta Q}{\Delta P}$ 即为需求曲线的斜率

substitution effect: 替代效应一定为正

income effect: 收入效应可正可负 当替代效应为正,而收入效应为负并且大于替代效应的时候, 出现一种违反需求规律的情况, 即 x 商品价格下降反而降低了需求.

- 1) Normal good: positive income effect
- 2) Inferior good: negative income effect
- 3) Giffen good: 负的收入效应大于正的替代效应. A Giffen good is theoretical and would have an upward-sloping demand curve.
- 4) Veblen good (奢侈品), a higher price makes the good more desirable.

Veblen good 是真实存在的 and have an upward-sloping demand curve.

- 1) Accounting profit (**cover 显性成本**)= total revenue – total accounting/explicit (显性)costs

Accounting costs include the interest cost on debt financing but not any payments to the firm's equity owners as a return on their invested capital.

- 2) Economic profit/abnormal profit (**再 cover 隐性成本, 一般为 0**)= accounting profit – implicit (隐性) costs = Total revenue – total economic costs

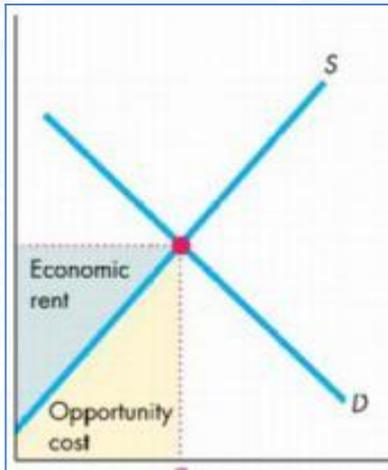
Total economic costs include both implicit and explicit costs

- 3) normal profit (争取为正)= accounting profit that makes **economic profit zero**, 也等于隐性机会成本.

The important thing is that **an economic profit of zero (normal profit) is what we expect in equilibrium.**

Overall, earning a positive economic profit will increase the value of a firm's equity, and negative economic profit will decrease the value of a firm's equity.

Economic rent is used to describe a payment to a factor of production above its opportunity cost.



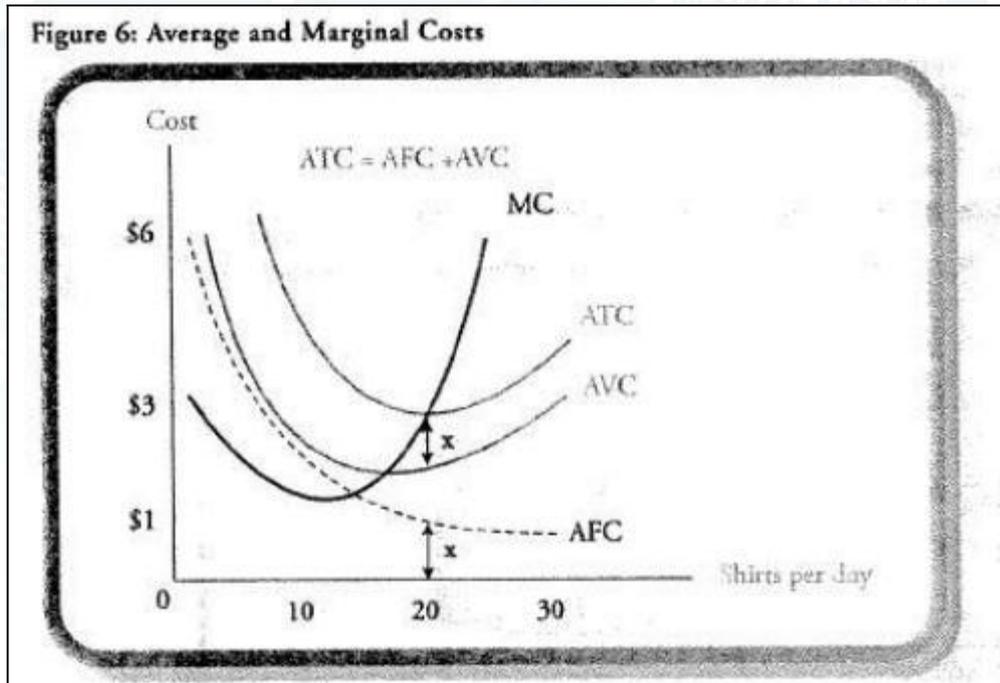
In a perfectly competitive market, an increase in supply by a single firm will not affect price.

For a firm in a perfectly competitive market, Average Revenue=Marginal Revenue=Price。

Firms that **face downward-sloping demand curves are referred to as price searchers.**

Factors production:

of 1) Land 2) Labor 3) Capital or PP&E 4) Materials



Important relationships as shown in figure above:

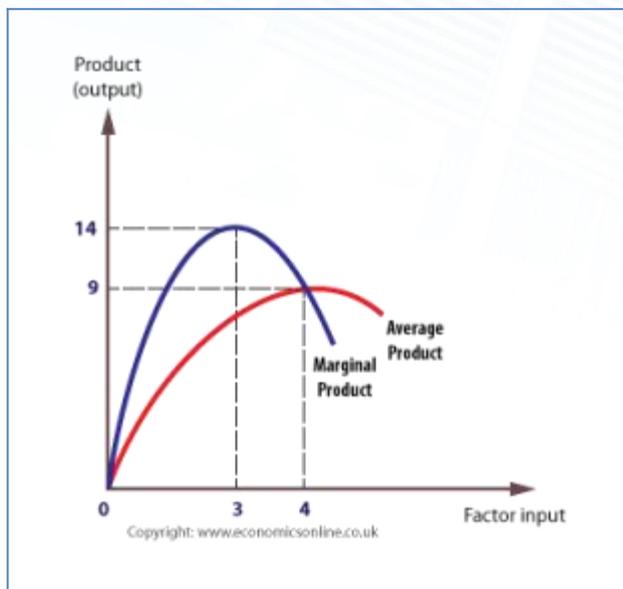
- 1) AFC slopes downward.
- 2) The vertical distance between the ATC and AVC curves is equal to AFC.
- 3) MC decreases initially, then increase. **At low output quantities, efficiencies are realized from the specialization of labor. However, as more and more labor is added, MC increases due to diminishing returns.**
- 4) MC intersects AVC and ATC at their minimum points.
- 5) ATC and AVC are U-shaped.
- 6) Minimum point on the ATC curve represents the lowest cost per unit, but it is not necessarily the profit-maximizing point. It means the firm is **maximizing profit per unit** at that point.
- 7) The MC curve above AVC is the firm's short-run supply curve in a perfectly competitive market.

Determine breakeven and shutdown points

- 1) Under perfect competition
 - 1.1) if $AR \geq ATC$, the firm should stay in the market in both the short and long run;
 - 1.2) If $ATC > AR \geq AVC$, the firm should stay in the market in the short run but will exit the market in the long run.
 - 1.3) If $AR < AVC$, the firm should shut down in the short run and exit the market in the long run.

- 2) Under imperfect competition, because price does not equal average revenue (or MR) for a firm in imperfect competition, analysis **based on total costs and revenues** is better suited for examining breakdown and shutdown points. The conditions are:
- 2.1) $TR=TC$, breakeven;
 - 2.2) $TC > TR > TVC$, firm should continue to operate in the short run but shutdown in the long run;
 - 2.3) $TR < TVC$, firm should shut down in the ST and LT run.

Marginal and average product curves



Determine the profit-maximizing level of output

- 1) Under perfect competition (price=MR)
 - 1.1) Producing up to the point where **MR=MC** and not producing additional units for which $MR < MC$.
 - 1.2) Producing the quantity for which **TR-TC** is at a maximum.

For a firm that is **operating at MR=MC but is selling at a price below AVC**, shutting down is really the profit-maximizing decision in the ST and LT run.

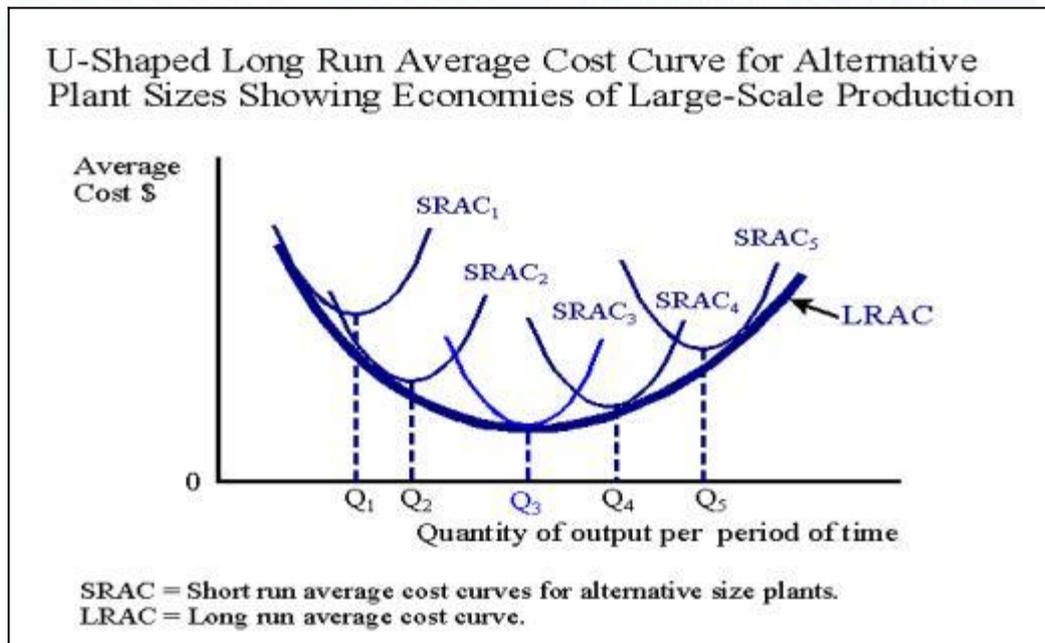
- 2) Under Imperfect Competition ($MR < Price$)

Produce the quantity of output for which **MR=MC**, the same quantity for which $TR - TC$ is at its maximum.

In the short run, for a given plant size, producing up to the quantity where $MR = MC$ will maximize profits as long as price at the output quantity is greater than AVC.

Some notes for the graph below:

- 1) Q_3 = minimum efficient scale
- 2) $Q < Q_3$: economies of scale, a firm operating with economies of scale can increase its competitiveness by expanding production and reducing costs.
- 3) $Q > Q_3$: diseconomies of scale, A firm operating under diseconomies of scale will want to decrease output and move back toward the minimum efficient scale.
- 4) Constant returns to scale: there may be relatively flat portion at the bottom of the LRATC curve.



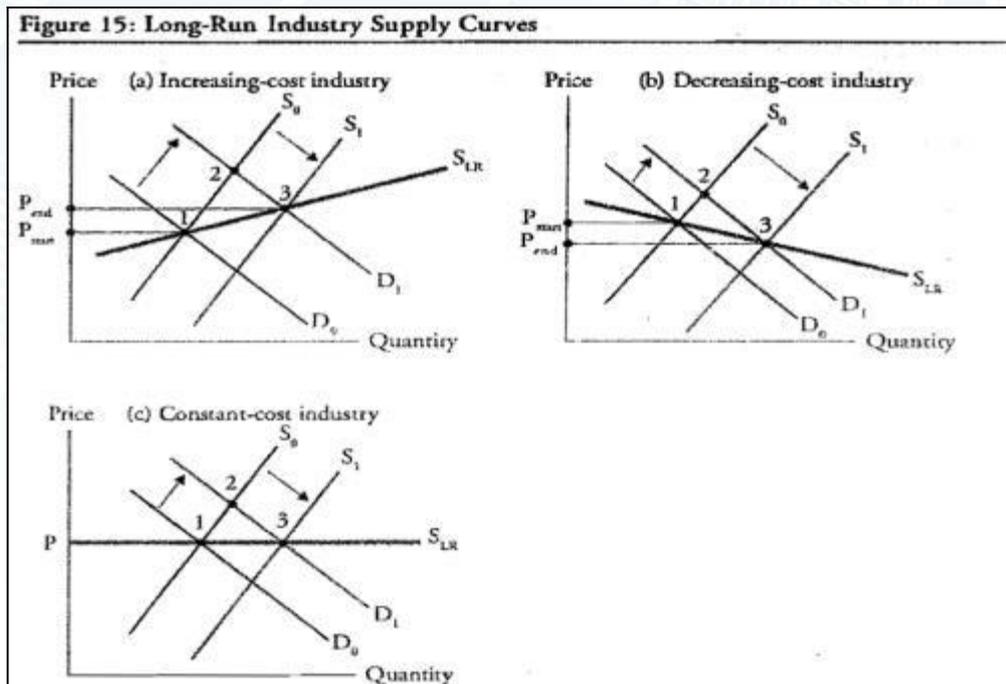
Increasing-cost industry: the long-run supply curve for the industry is upward sloping (oil is an example)

Decreasing-cost industry: the long-run industry supply curve is downward sloping (flat-panel television is an example)

Constant-cost industry: the industry demand curve is perfectly elastic at minimum average cost.

The long-run industry supply curve is perfectly elastic at the ATC for the minimum efficient scale. This result will hold only if the cost of the firms' input is constant as the industry expands output.

Below point moved from $1 > 2 > 3$



- 1) For analysis, the usefulness of the total product measure is limited;
- 2) Average product is a measure of overall efficiency, not the efficiency of any one worker.
- 3) **Marginal product (越大越好)** is a better measure of the productivity of an individual worker and is preferred over average product or total product. A firm experiencing an increase in the marginal product of labor employed would most likely to allow an increased number of workers to specialize and become more adept at their individual functions.

Increasing the quantity of capital for a given quantity of labor will at first result in increasing marginal returns to capital, however, employing additional units of capital will result in smaller increases in output. This is the point of **diminishing marginal returns to capital**.

For a firm with N productive inputs, **cost minimization** requires that:

$$\frac{MP_1}{P_1} = \frac{MP_2}{P_2} = \dots = \frac{MP_N}{P_N} \quad (\text{MP}=\text{marginal product, } P=\text{price, 公式中各项为各})$$

生产要素, 比如 labor, capital)

MP/P 衡量单位生产要素的产品数量, 越大说明越有效率, 应该多雇佣(考虑 diminishing marginal productivity)

To maximize profits, it requires that:

$$\frac{MP_1 * MR_{output}}{P_1} = \frac{MP_2 * MR_{output}}{P_2} = \dots = \frac{MP_N * MR_{output}}{P_N}$$

or

$$\frac{MRP_1}{P_1} = \frac{MRP_2}{P_2} = \dots = \frac{MRP_N}{P_N} = 1$$

其中 MRP = marginal revenue product (产品总收入), P 为 input price.

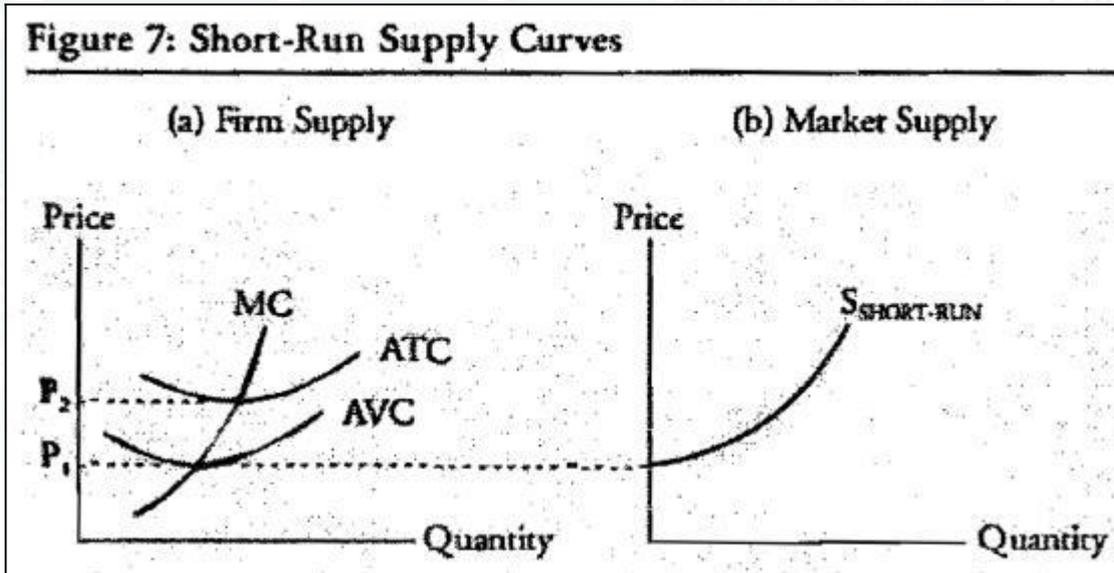
Module 2 The firm and Market Structures

- 1) perfect competition(price taker) 价格由市场决定
- 2) monopolistic competition 垄断竞争 products are not identical
- 3) oligopoly market 寡头垄断 only a few firms competing, such firms are interdependent, barriers to entry are high
- 4) Monopoly 完全垄断 a single seller of a product with no close substitutes. High barriers to entry
- 5) Natural monopoly 自然垄断 examples are electric power and distribution business and other public utilities.

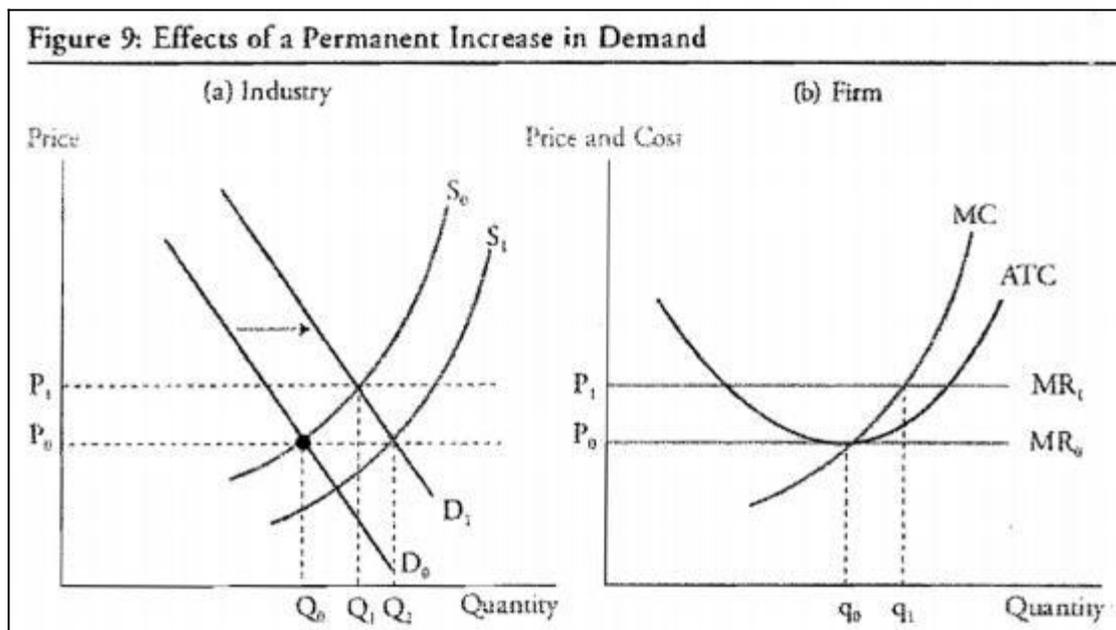
1) Perfect Competition

In short-run, economic profit is maximized at the quantity for which $MR=MC$ In long-run equilibrium, each firm is producing the quantity for which $P=MR=MC=ATC$, so that **all firms earn normal profit (zero economic profits, and firms can stay in the business in the long run) and each firm is producing the quantity for which ATC is a minimum.**

图(b)为市场的短期供给曲线



In below graph, a permanent change in demand, $D_0 > D_1$, the price increases from P_0 to P_1 , existing firm realize economic profit, which attracts more firms to enter the industry, then $S_0 > S_1$, price decreases back to P_0 .



2) Monopolistic Competition

Firms in monopolistic competition face downward-sloping demand curves (price search).

Product innovation is a necessary activity as firms in monopolistic competition pursue economic profits. Firms that bring new and innovative products to the market are confronted with less-elastic

demand curves, enabling them to increase price and earn economic profits.

A firm is considered to be spending the optimal amount on innovation when **the marginal cost of innovation just equals the marginal revenue of additional innovation.**

Advertising expenses are high for firms in monopolistic competition. Many firms spend a significant portion of their advertising budget on brand name promotion.

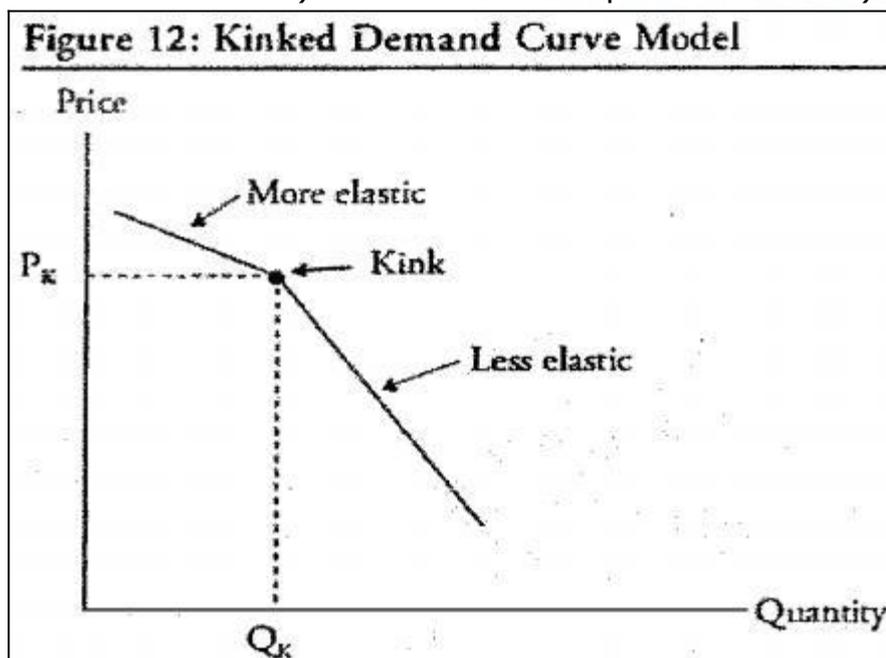
3) Oligopoly

The actions of another firm will directly affect a given firm's demand curve for the product.

3.1) Kinked demand curve model

Based on the assumption that 竞争对手跟着降价不跟着涨价 Q_k is the profit maximizing level of output.

Shortcoming: what determines the market price (where the kink is located) is outside the scope of the model)



3.2) Cournot model, an early version of strategic games

3.3) Nash equilibrium is reached when the choices of all firms are such that there is no other choice that makes any firm better off.

In general, collusive agreements to increase price in an oligopoly will be more successful (have less cheating) when (产品同质, 处罚严重):

- 3.3.1) There are fewer firms;
- 3.3.2) Products are more similar (less differentiated);
- 3.3.3) Cost structures are more similar;
- 3.3.4) Purchases are relatively small and frequent;

3.3.5) Retaliation by other firms for cheating is more certain and more

severe;

3.3.6) There is less actual or potential competition from firms outside the

cartel.

3.4) dominant firm model 优势厂商模型

There is a single firm that has a significant large market share because of its greater scale and lower cost structure.

A price decrease by one of the competitive firms will lead to a decrease in price by the dominant firm, and competitive firms will decrease output and/or exit the industry in the long run. The long-run result of such price decrease by competitors would **increase the market share of the dominant firms.**

In the long run, the dominant company's market share tends to decrease as profits attract entry by other companies.

4) Monopoly (完全垄断)

Two pricing strategies: single-price, price discrimination

The profit maximizing output for a monopolistic firm is the one for which

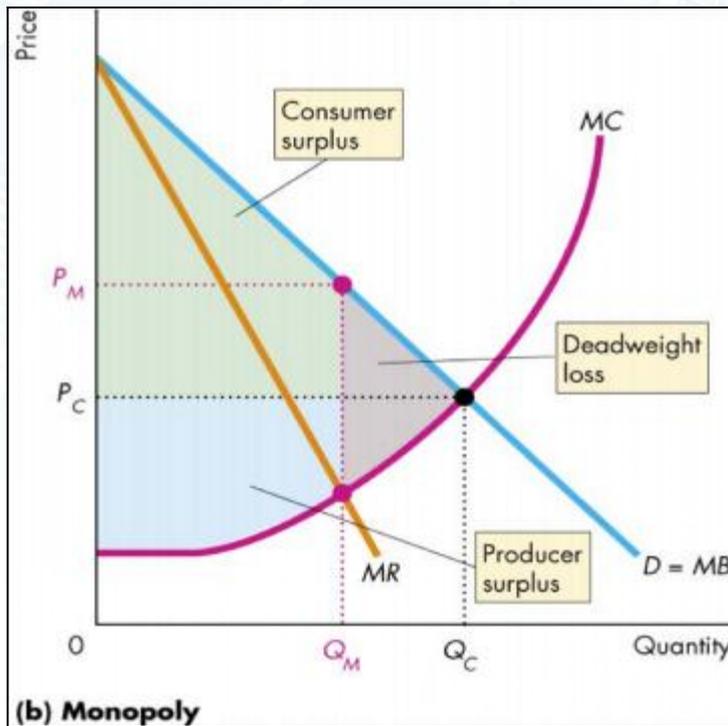
MR=MC.

Monopolists are **price searches** and have imperfect information regarding market demand.

With price discrimination, the motivation for a monopolist is to **capture more consumer surplus as economic profit than is possible** by charging a single price.

When compared to a perfectly competitive industry, the monopoly firm will produce less output and charge a higher price.

Monopoly is considered **inefficient** as it creates a DWL relative to perfect competition because monopolies produce a quantity that does not maximize the sum of consumer surplus and producer surplus. A further loss of efficiency results from **rent seeking** when producers spend time and resources to try to acquire or establish a monopoly.



With perfect price discrimination, there would be no consumer surplus. Monopolists would capture it all. A monopolist would produce the same quantity as under perfect competition. A government entity that regulates an authorized monopoly will most likely base regulated prices on long run average cost.

5) Natural Monopoly

When the average cost of production for a single firm is falling throughout the relevant range of consumer demand, we say that the industry is a natural monopoly.

5.1) Average cost pricing is the most common form of regulation. This will:

5.1.1) Increase output and decrease price

5.1.2) Increase social welfare (allocate efficiency)

5.1.3) Ensure the monopolist a normal profit because $\text{price} = \text{ATC}$

5.2) Marginal cost pricing (efficient regulation)

This will:

5.2.1) Increase output and decrease price

5.2.2) Cause the monopolist to incur a loss because $\text{price} < \text{ATC}$.

5.2.3) This solution **requires a government subsidy** in order to

provide the firm with a normal profit and prevent it from leaving the market entirely.

5.3) Another way of regulating a monopoly is for the government to sell the monopoly right to the highest bidder.

In markets characterized as monopolistic competition, oligopoly, and monopoly, there is no well-defined supply function.

In each case, the quantity supplied is determined by the intersection of MC and MR, and the price charged is determined by the demand curve.

Pricing strategy under each market structure

- 1) Perfect competition
 $MR=MC=P$
- 2) Monopolistic competition
 $MR=MC < P$
- 3) Monopoly
 $MR=MC < P$
- 4) Oligopoly
 - 4.1) Kinked demand curve: $MR=MC$
 - 4.2) Collusion: $MR=MC$ and charge the price from the industry demand curve at which that quantity can be sold.
 - 4.3) Dominant firm model: $MR=MC$ and charge the price on its firm demand curve for that quantity. Other firms take the price as given.
 - 4.4) Game theory

$$MR=P(1-1/E_p)$$

E_p is the price elasticity of demand

Concentration measures for a market or industry are very often used as an indicator of market power.

- 1) N-firm concentration ratio, 缺点是 relatively insensitive to mergers of two firms with large market shares.
- 2) HHI, calculated as the sum of the squares of the market shares of the largest firms in the market. HHI values below 100 indicate the market is highly competitive.

以上两种方法的共同缺点是 **barriers to entry are not considered.**

Figure 23: Characteristics of Market Structures

	<i>Perfect Competition</i>	<i>Monopolistic Competition</i>	<i>Oligopoly</i>	<i>Monopoly</i>
Number of sellers	Many firms	Many firms	Few firms	Single firm
Barriers to entry	Very low	Low	High	Very high
Nature of substitute products	Very good substitutes	Good substitutes but differentiated	Very good substitutes or differentiated	No good substitutes
Nature of competition	Price only	Price, marketing, features	Price, marketing, features	Advertising
Pricing power	None	Some	Some to significant	Significant

Market Structure Degree of Product Differentiation

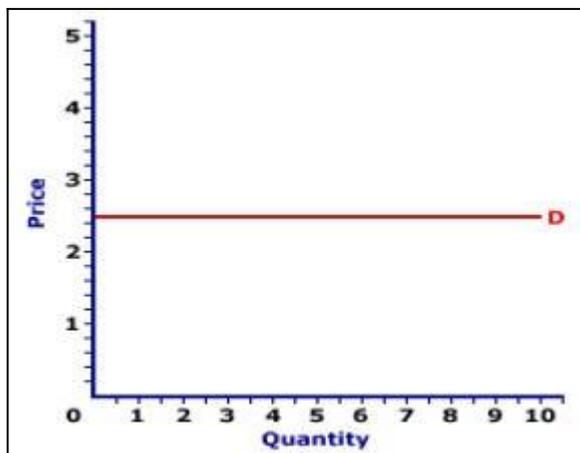
Perfect competition (price taker) Homogeneous/ standardized

Monopolistic competition (price searcher) Differentiated

Oligopoly (price maker) Homogeneous/ standardized

Monopoly (price searcher, downward-sloping demand curve) Unique product

Perfect competition, $P=MR=AR$



Module 3 Aggregate Output, Prices, and Economic Growth☆☆☆

GDP is the total market value of the goods and services produced in a country within a certain time period. GDP included only purchase of newly produced goods and services.

Items those are included in GDP:

1) Goods and services provided by government;

2) The value of **owner-occupied housing**. **Items those are excluded in GDP:**

1) **The sale or resale of goods produced in previous periods;**

2) **Transfer payments** made by the government are not economic output and **are not included** in the calculation of GDP.

3) The value of labor not sold, such as a homeowner's repairs to his own home, is not included in GDP.

4) By-products of production, such as **environment damage**, are not included in GDP.

GD(domestic)P是按国土原则计算的, 只要其经济活动是领土范围内, 不管是本地居民还是外地居民都要计算在内;

GN(national)P是按国民原则计算的, 只要是本地居民, 不管生活在本地还是外地, 其经济活动都要计算在内.

Expenditure approach: GDP is calculated by summing the amounts **spent** on goods and services produced during the period;

Income approach: GDP is calculated by summing the amounts **earned by households and companies** during the period, **including wage income, interest income, and business profits.**

Value-of-final-output method: the calculation of GDP under the expenditure approach;

Sum-of-value-added method: sum the additions to value created at each stage of production and distribution.

Nominal GDP: the total value of all goods and services produced by an economy, valued at current market price.

Real GDP is calculated relative to a base year.

$$\text{GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} = \frac{\text{Current year price} * \text{Current year quantity}}{\text{prior year price} * \text{Curreny year quantity}}$$

Per-capital real GDP is defined as real GDP divided by population and is often used as a measure of the economic well being of a country's residents.

Under the expenditure approach, **GDP=C+I+G+(X-M) ----- (1)**

Under the income approach,

GDP=national income + capital consumption allowance + statistical discrepancy

- 1) CCA measures the depreciation of physical capital from the production of goods and services over a period.
- 2) National income is the sum of the income received by all factors of production that go into the creation of final output.
- 3) Personal income is a measure of the pretax income received by households and is one determinant of consumer purchasing power and consumption.

Personal income = national income
 + Transfer payments to households
 - Indirect business **taxes**
 - Corporate income **taxes**
 - **Undistributed corporate profits**

Personal disposable income (PDI) = personal income – personal tax

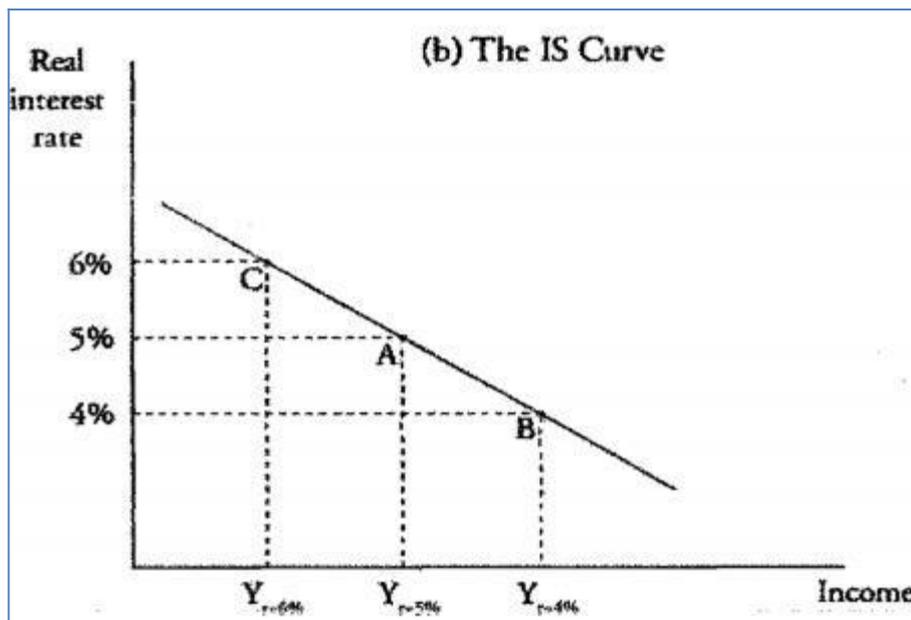
Under the income approach, $GDP=C+S+T$ -----

(2) Combine (1) and (2) $> (G-T)=(S-I)-(X-M)$

政府预算赤字($G-T > 0$)必须由贸易赤字($X-M < 0$)或者私人投资($S-I > 0$)来融资取得.

If $G-T$ increases, it must be financed by $S-I$ increase or $X-M$ decrease.

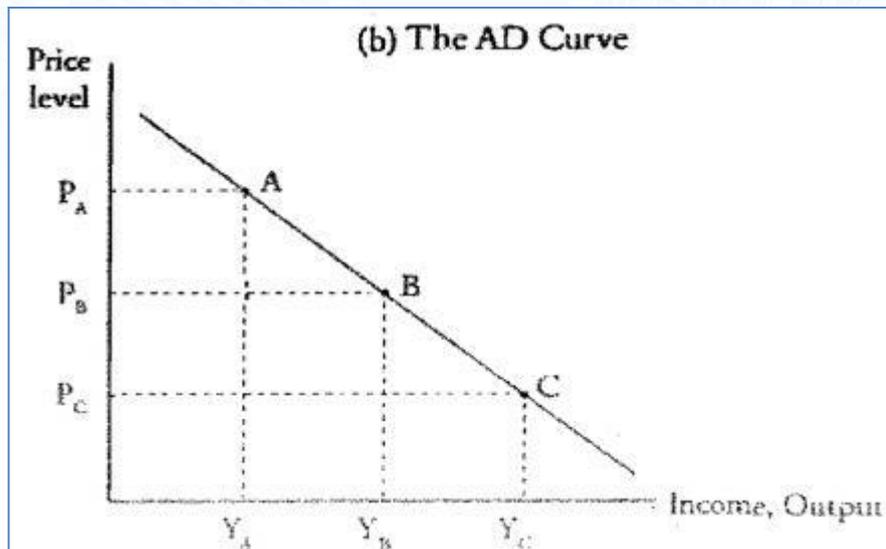
As below, higher rates will decrease the real aggregate income. The IS curve (投资者储蓄曲线) plots the combinations of **income and real interest rates** for which aggregate output and income equal planned expenditure.



Quantity theory of money: $MV=PY$

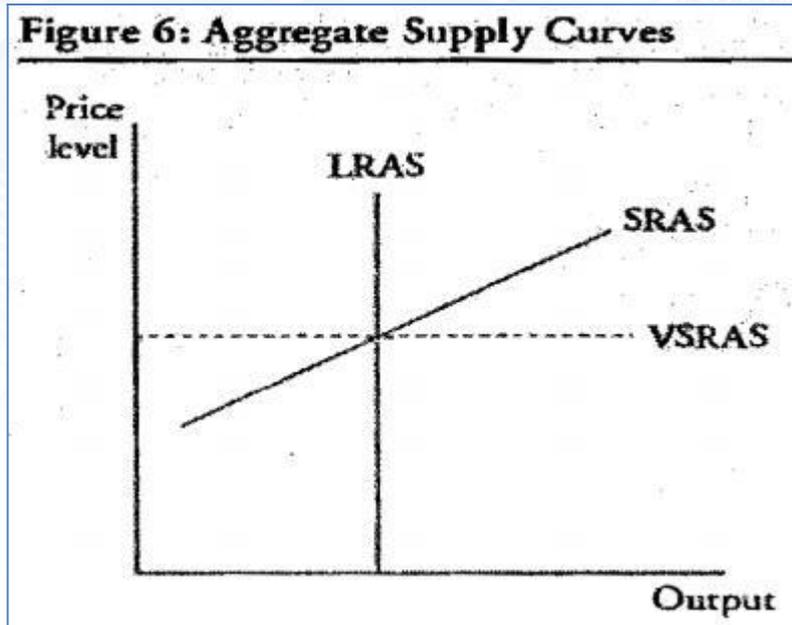
The LM curve represents combinations of income and the interest rate at which the demand for real money balance equals the supply.

The aggregate demand curve shows the relationship between the quantity of real output demanded (which equals real income) and the price level.



The aggregate supply curve describes the relationship between the price level and the quantity of real GDP supplied.

In the long run, wages and other input prices change proportionally to the price level, so the price level has no long-run effect on aggregate supply. We refer to this level of output as **potential GDP** or **full-employment GDP**.



The full employment (the intersect of LRAS and x axis), or natural, level of output is a level with a modest, stable pool of unemployed workers (**job seekers equal job vacancies**) looking for and transitioning into new jobs.

Shift in the AD curve

Note that a change in the price level is represented, as a movement along the AD curves, not a shift in the AD curve.

Consider $GDP = C + I + G + \text{net } X$

- 1) Increase in consumers' wealth (C increases; as the value of households' wealth increases, the proportion of income saved decreases and spending increases, increasing AD) > **wealth effect**
- 2) Business expectation (I increases)
- 3) Consumer expectations of future income (C increases)
- 4) High capacity utilization (I increases)
- 5) Expansionary monetary policy (C and I increase)
- 6) Expansionary fiscal policy (C increases for tax cut, G increases for spending increase)
- 7) exchange rate (贬值增加出口)
- 8) global economic growth (外国需求大, 出口增多)

Shifts in short-run aggregate supply curve:

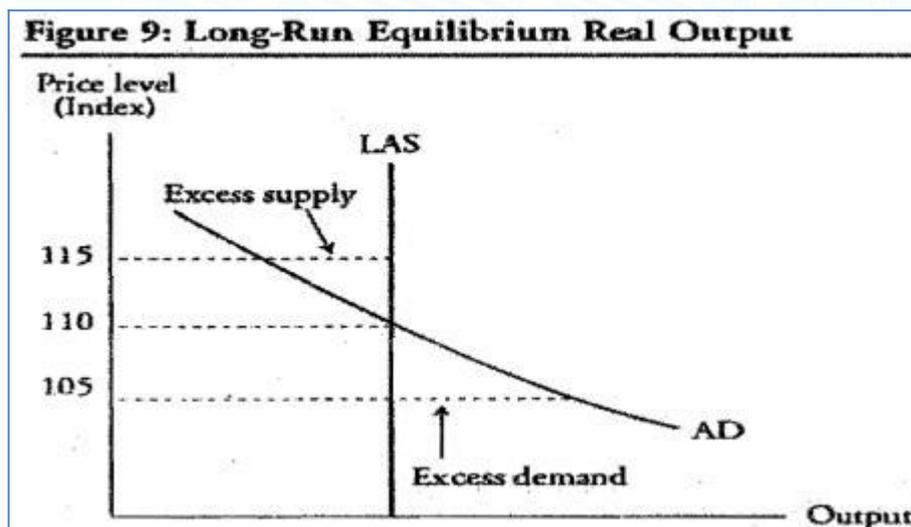
- 1) Labor productivity
- 2) Input prices
- 3) Expectations of future output prices

- 4) Taxes and government subsidies
- 5) exchange rate (汇率贬值,进口成本下降,依赖进口生产的企业则会增加产量)

Shifts in long-run aggregate supply curve:

Factors that affect the real output that an economy can produce at full employment will shift the LRAS curve.

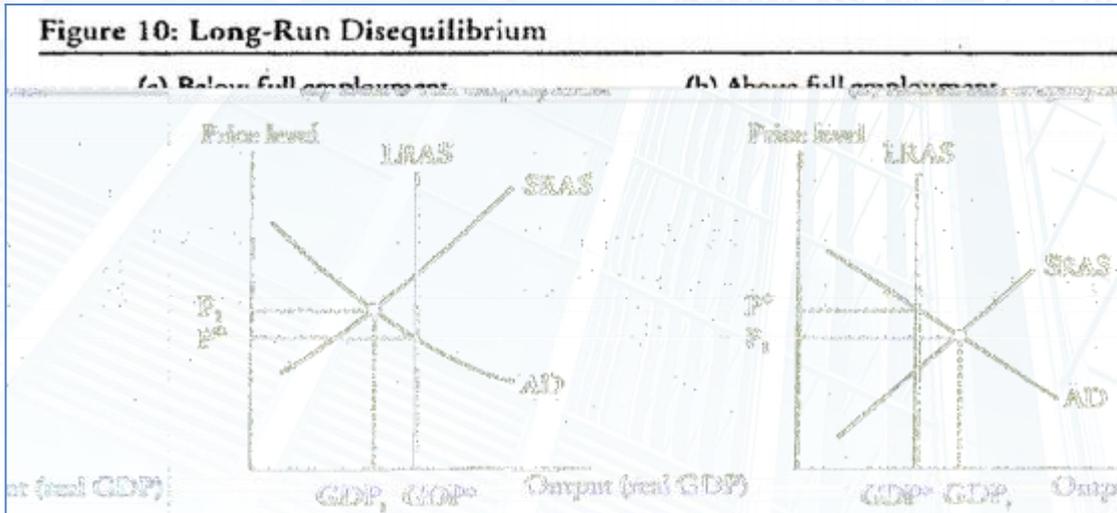
- 1) Increase in the supply and quality of labor
- 2) Increase in the supply of natural resources
- 3) Increase in the stock of physical capital
- 4) Technology



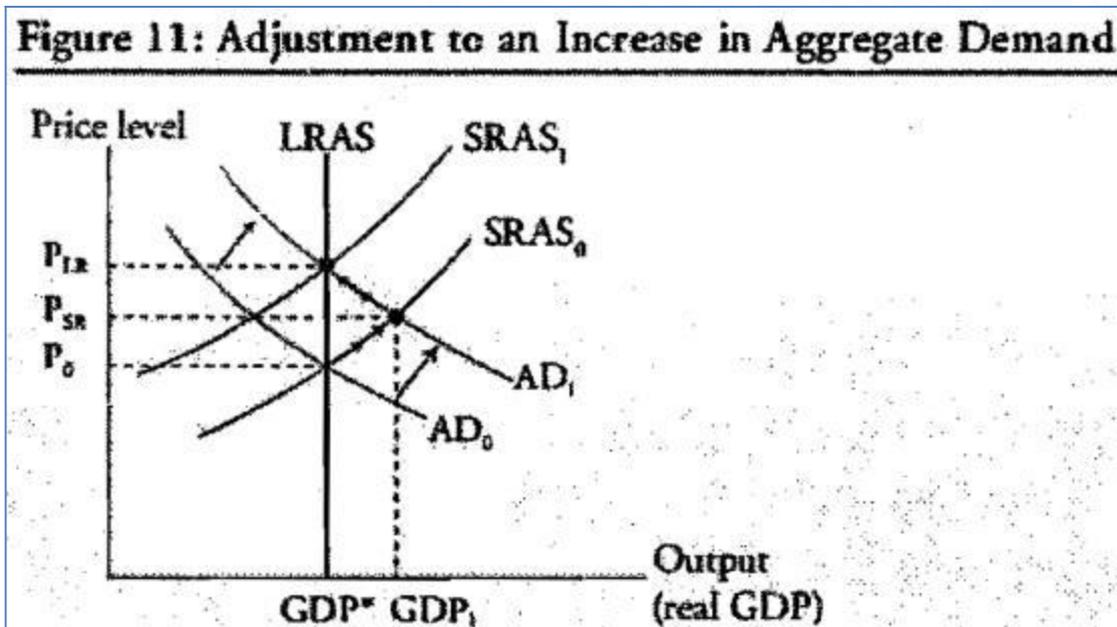
With the price level at 115, there is excess supply; this is sometimes termed a **recessionary gap**;

With the price level at 105, there is excess demand; this is sometimes termed as an **inflationary gap**.

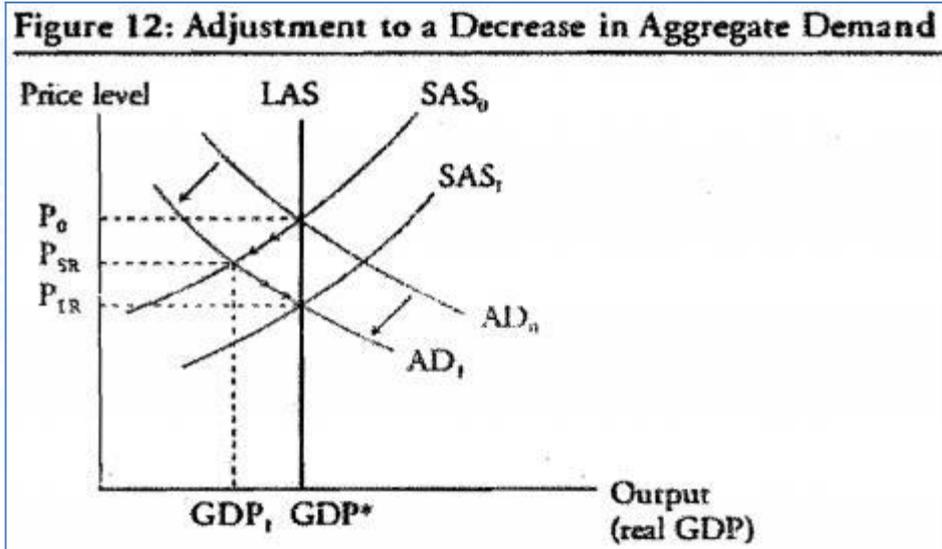
以下两图,均为 SRAS 移动,左图造成产出缺口 output gap,价格从 P_1 到 P^* ; 右图价格从 P^* 到 P_1 .这些偏离于 full-employment GDP 的情况都是由 change in AD 造成的, which is caused by changes in the money supply. 总之,货币供给影响总需求,继而影响 GDP.



An increase in resources prices that cause SRAS to decrease (shift to the left)



A decrease in wages and other input prices increase short-run aggregate supply (move it down to the right)

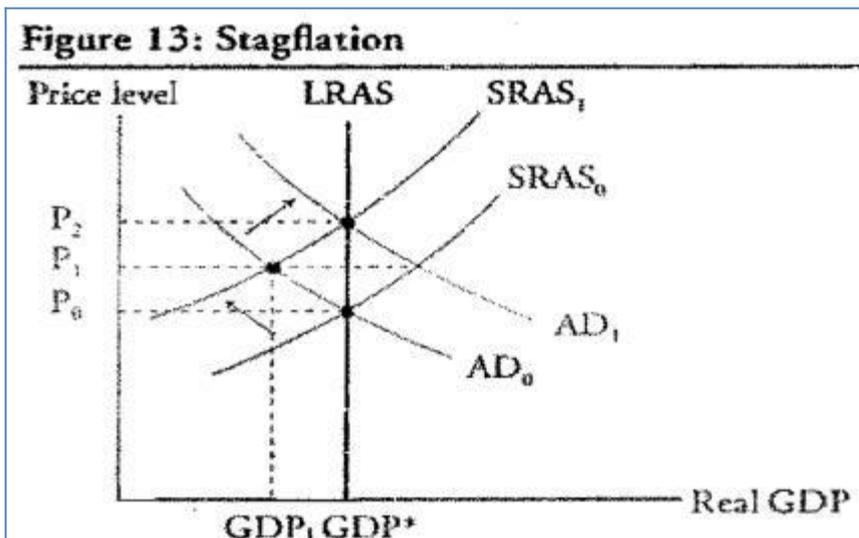


Stagflation (滞胀) refers to an environment of both high unemployment and increasing inflation.

经常因为价格的急剧上升而产生供给骤降.政府不加干预也会恢复但时间长有政治风险.

An investor anticipating stagflation should:

- 1) Decrease investment in FID
- 2) Decrease investment in equities
- 3) Increase investment related to commodities



Five sources of economic growth

- 1) Labor supply
- 2) Human capital
- 3) Physical capital stock
- 4) Technology

5) Natural resources

Growth in potential GDP = growth in labor force + growth in labor productivity (can be measured directly, output/hour)

The sustainable rate of economic growth is important because long-term equity returns are highly dependent on economic growth over time.

Labor productivity can be increased by either improving technology or physical capital per worker. However, because of **diminishing marginal productivity**, sustainable long-term growth cannot necessarily be achieved simply by increasing physical capital per worker over time, **productivity gains and growth of the labor force** are also necessary for long-term sustainable growth.

Solow model or neoclassical model:

Growth in potential GDP = growth in technology + W_L (growth in labor) + W_C (growth in capital) (其实就是对上述公式的分拆)

W_L and W_C are labor's percentage share of national income and capital's percentage share of national income.

An increase in total factor productivity reflects an increase in output for given inputs.

Module 4 Understanding Business Cycle

Real GDP and unemployment rate are the key variables used to determine the current phase of the cycle.

A common rule of thumb is to consider two consecutive quarters of growth in real GDP as the beginning of an expansion and two consecutive quarters of declining real GDP as indicating the beginning of a contraction. 农业或者计划经济不在讨论范围之内, 只由 private corporations.

Resource use fluctuation

- 1) When an expansion is approaching its peak, sales growth begins to slow, and unsold inventories accumulate. This can be seen in **an increase in the inventory-sales ratio above its normal level**.
- 2) The opposite occurs when a contraction reaches its trough, **inventory-sales ratio decreases below its normal level**. Only

when an expansion or contraction appears likely to persist
will they hire or lay off workers.

Housing sector activity

- 1) Mortgage rates
- 2) Housing costs relative to income
- 3) Speculative activity
- 4) Demographic factors

External trade sector activity

- 1) Domestic GDP growth
- 2) GDP growth of trading partners
- 3) Currency exchange rate

Typical business cycle characteristics:

1) Trough

Moderate or decreasing inflation rate

Spending on consumer durable goods and housing
may increase Increasing use of overtime and
temporary workers

2) Expansion Real GDP is increasing Inflation rate may increase

Investment increases in producers' equipment and home
construction

3) Peak

Real GDP stops increasing and begins decreasing

Unemployment rate decreases but hiring slows

Inflation rate increases

Consumer spending and business investment grow at slower
rates

4) Contraction

GDP growth rate is negative

Unemployment rate increases

Inflation rate decreases with a lag

Leading indicator

- 1) Unemployment insurance initial claims
- 2) ISM new orders
- 3) Building permits
- 4) Stock price

5) IR spread

Coincident indicator

- 1) Non-farm payroll
- 2) Industrial production
- 3) Manufacturing and trade sales Lagging indicator

- 1) CPI
- 2) Labor cost
- 3) Inventory/sale ratio
- 4) Commercial/industrial loans

Based on typical **labor utilization patterns** across the business cycle, **productivity** (output per hours worked) is mostly likely to be **highest at the bottom of a recession.**

1) Neoclassical school 新古典学派——大萧条伪证

Both aggregate demand and aggregate supply are primarily driven by changes in **technology** over time. They conclude that business cycle is temporary deviations from long-run equilibrium.

2) Keynesian school (Bernanke) believed that shifts in aggregate demand due to changes in expectations were the primary cause of business cycle. **通过财政 / 货币政策增加总需求**

3) Monetarist school 货币学派, 由货币供应(**应该稳定**)引起. They **favored a limited role for government because they argue government policies operate with a lag.**

4) Austrian school 奥地利学派 **believe business cycles are caused by government intervention** in the economy.

5) New classical school 新古典学派 introduced **real business cycle theory** 真实周期理论 (**反对财政 / 货币干预**) the policymakers **should not try to counteract business cycles** because expansions and contractions are efficient market responses to real external shocks.

1) Frictional unemployment

2) Structural unemployment

The unemployed workers do not currently have the skills needed to perform the jobs that are available.

3) Cyclical unemployment is caused by changes in the general level of economic activity.

- 1) A person who is not working is considered to be unemployed if he is actively searching for work. One who has been seeking work unsuccessfully for several months is referred to as long-term unemployed.
- 2) The discouraged workers are those who are available for work but are neither employed nor actively seeking employment.
- 3) **The unemployment rate is the percentage of people in the labor force who are unemployed.** The labor force includes all people who are either employed or unemployed.
People who choose not to be in the labor force are said to be **voluntarily unemployed** and are not included in the calculation of the unemployment rate.
- 4) A person who is employed part time but would prefer to work full time or is employed at a low-paying job despite being qualified for a significant higher-paying one is said to be **underemployed**.
- 5) **The participation ratio** is the percentage of the **working-age population** who are either employed or actively seeking employment.

计算过程: Labor force (employed and unemployed) = working age population * participation rate

The unemployment rate to lag business cycle because:

- 1) The movement of discouraged workers out of and back into the labor force
- 2) Firm tend to be slow in hire or lay off workers at business cycle turning points

- 1) Inflation
- 2) hyperinflation 超级通胀
- 3) Disinflation—inflation rate is decreasing but remains greater than 0
- 4) deflation (通缩)— negative inflation rate

CPI

The weights assigned to each good and service reflects the typical consumer's purchasing patterns, which are likely to be significantly different across countries and regions.

An alternative is the price index for personal consumption expenditure. 个人消费支出价格指数 PPI (**identify trends of CPI**)/WPI

Headline inflation: price indexes for all goods.

Core inflation: price indexes that exclude food and energy.

之前说的全部是 **Lapeyres**, which uses a constant (last) basket of goods and services. Three factors cause it to be **biased upward** as a measure of the cost of living:

- 1) New goods
- 2) Quality changes--use **hedonic pricing** to adjust for this
- 3) Substitution--use a chained or chain-weighted price index such as **fisher index** to address this. Paasche index also works to reduce substitution bias.

Paasche index uses a constant (present) basket of goods, prices from the base period, and prices in the current period.

$$\text{Fisher Index} = (I_L * I_P)^{0.5}$$

Two types of inflation

- 1) **Cost-push** results from a decrease in aggregate supply

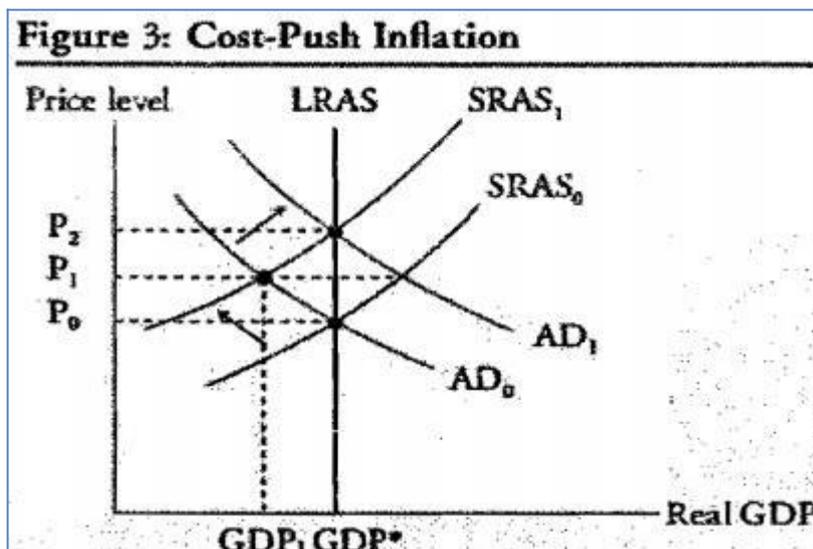
New technology will increase the output per hour per worker, which will decrease the unit labor cost. As the unit labor cost decreases, cost-push inflation decreases

工资上涨原因: 1)周期性失业低 2)预期通胀

Analysts use **labor productivity** to identify signals of potential wage pressure. Wage increases are not inflationary as long as they remain in line with gains in productivity.

Non-accelerating inflation rate of unemployment (NAIRU), also called the **natural rate of unemployment (NARU)**.

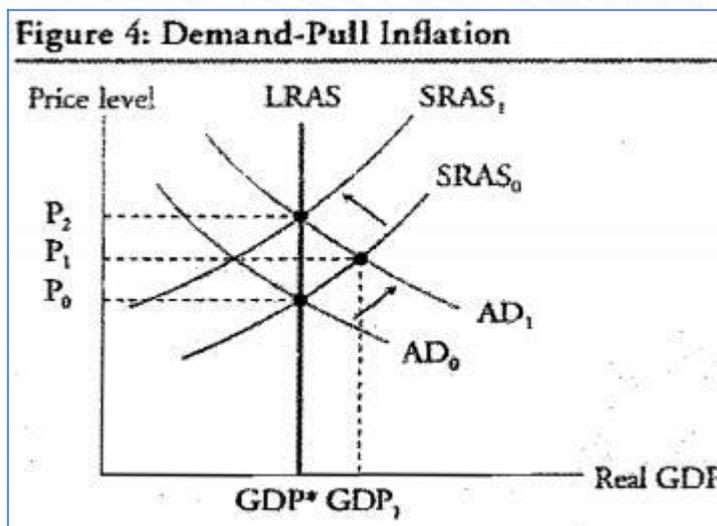
自然失业率 > full employment > 没有结构性失业



- 2) Demand-pull inflation results from an increase in the money supply, increased government spending, or any other change that increases government spending.

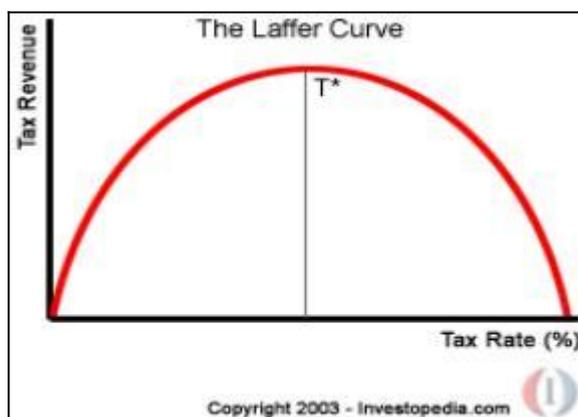
Demand-pull inflation would persist until the central bank reduced the growth rate of the money supply and allowed the economy to return to full employment equilibrium at a level of real GDP equal to potential GDP.

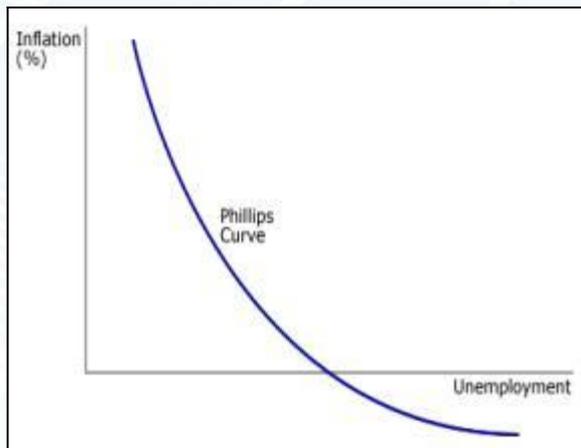
Economists often use the capacity utilization rate of industry to indicate the potential for demand-pull inflation.



Falling unemployment rate puts upward pressure on real wages, which result in a decrease in SRAS.

The impact on output is the key difference between demand-pull and cost-push effects. **The demand-pull effect increases GDP above full-employment GDP, while with cost-push inflation; a decrease in aggregate supply initially decreases GDP.**





Module 5 Monetary and Fiscal Policy☆☆☆

Money has three primary functions:

- 1) Medium of exchange/means of payment
- 2) unit of account 计价单位
- 3) Store of value

Narrow money is the amount of notes and coins in circulation in an economy plus balances in checkable bank deposits.

Broad money included narrow money plus any amount available in liquid assets, which can be used to make purchases.

广义货币比狭义货币的流动性差

$$\text{money multiplier} = \frac{1}{\text{reserve requirement}} = \frac{1+CD}{RR+CD}$$

Money supply * velocity = price * output ($MV=PY$, Y 为 real GDP)

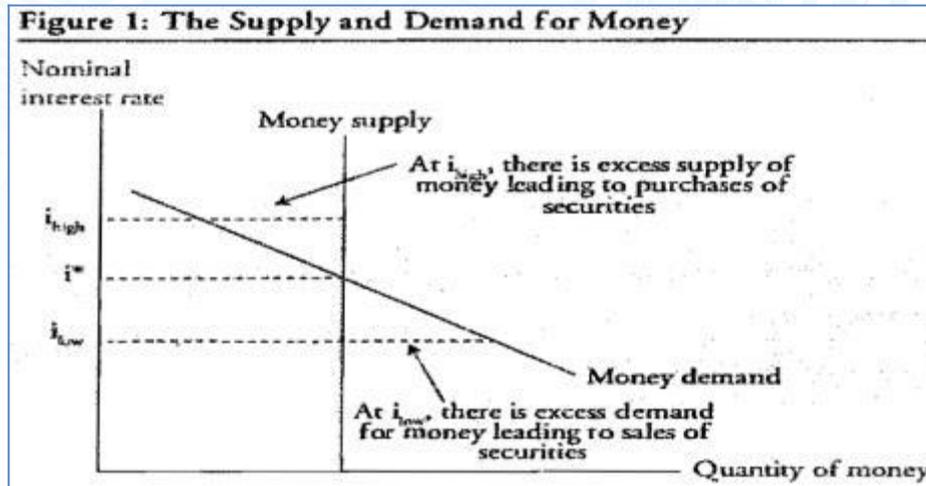
The belief that output (GDP) and velocity are not affected by monetary variables (money supply and prices) is referred to as **money neutrality**.

Three reasons for holding money:

- 1) transaction demand, 和真实 GDP 成正比
- 2) precautionary demand, 和真实 GDP 成正比
- 3) Speculative demand, it is **inversely related to market returns and positively related to risks**.

The supply of money is determined by the central bank and is independent of the interest rate, 所以下图中是垂线

At i_{high} , there is excess supply of money, firms and households are holding more real money balances than they desire to. At i_{low} there is excess demand for real money balances, firms and households will sell securities to increase their money balance to desired level.



Fisher effect: $R_{Nom} = R_{Real} + E [I]$

The real interest rate is relatively stable; this is consistent with money neutrality 进一步地, $R_{Nom} = R_{Real} + E[I] + RP$ (RP = risk premium for uncertainty)

Key roles of central banks

- 1) Sole supplier of currency. Money not backed by any tangible value is termed fiat money.
- 2) Banker to the government and other banks
- 3) Regulator and supervisor of payments system
- 4) Lender of last resort
- 5) Holder of gold and foreign exchange reserves
- 6) Conductor of monetary policy

The primary goal of a central bank is to **control inflation**. High inflation leads to menu costs and shoe leather costs.

The pegging country essentially commits to a policy intended to make its inflation rate equal to the inflation rate of the country to which they peg their currency.

Costs of unexpected inflation

- 1) Higher borrowing rates
- 2) Information about supply and demand from changes in prices becomes less reliable

Monetary policy tools

- 1) Policy rate. The rate at which banks can borrow reserves from the Fed is termed the discount rate. For the ECB, it is called the **refinancing rate**.
BOE policy rate is called the **two-week repo (repurchase) rate**.
In US, the **federal funds rate** is the rate that banks charge each other on overnight loans of reserves. The Fed sets a target for this market-determined rate and use open market operations to move it to the target rate.
- 2) Reserve requirements. This tool only works well to increase the money supply if banks are willing to lend and customers are willing to borrow.
- 3) Open market operations are buying and selling of securities by the central bank. Most commonly used and is important in **achieving the federal funds target rate**.

Qualities of effective central banks

- 1) Independence: operational independence (decides to how to achieve the target) and target independence (sets its own target).
- 2) Credibility
- 3) Transparency

- 1) Interest rate targeting
- 2) Inflation targeting (popular)
- 3) Some developing countries use exchange rate targeting. One result of this may be **greater volatility of the money supply** because domestic monetary policy must **adjust money supply growth rate** to the necessity of maintaining a stable foreign exchange rate.

The net effect of this is that **the targeting country will have the same inflation rate as the targeted currency** and the **targeting country will need to follow monetary policy** and accept interest rates that are consistent with this goal, regardless of domestic economic circumstances.

- 1) An economy's long-term sustainable real growth rate is called the **real trend rate**. The trend rate is not directly observable and **must be estimated**.
- 2) The neutral interest rate of an economy is the growth rate of the money supplies that neither increases nor decreases the economic growth rate.

Neutral interest rate = real trend rate of economic growth + inflation target

When the policy rate is above (below) the neutral rate, the monetary policy is said to be contractionary (expansionary).
(policy rate 和 neutral rate 相比较)

Liquidity trap: A situation in which prevailing **interest rates are low and savings rates are high**, making monetary policy ineffective. In a liquidity trap, consumers choose to keep their funds in savings because of the prevailing belief that interest rates will soon increase. (Deflation + expansionary money supply policy)
Compared to inflation, deflation is more difficult for central banks because they are limited to reducing the nominal policy rate to 0.

Fiscal policy refers to a government's use of spending and taxation to meet macroeconomic goals.

- 1) Keynesian economists believe that **fiscal policy**, through its effect on aggregate demand, can have a strong effect on economic growth when the economy is operating at less than full employment.
- 2) 货币学派认为财政政策只是短暂的, 只由**货币政策**才能影响通胀, 不是影响总需求

Discretionary fiscal policy refers to the spending and taxing decisions of a national government that are intended to stabilize the economy. In contrast, **automatic stabilizers** (自动稳定器, in a recession, tax will fall, and government spending on unemployment insurance will increase, both of these are expansionary) are built-in fiscal devices triggered by the state of the economy.

Objectives of fiscal policy:

- 1) Influencing the level of economic activity and aggregate demand
- 2) Redistributing wealth and income among segments of the population.
- 3) Allocating resources among economic agents and sectors in the economy.

Fiscal policy tools

- 1) Spending tools (most efficient in increasing aggregate demand) Transfer payments (slow)
Current spending
Capital spending (slow)
- 2) Revenue tools

2.1) **Direct taxes** (slow) are levied on income or wealth. 2.2) **Indirect taxes** (quick) are levied on goods and services.

1) Advantage of fiscal policy:

1.1) Social policies (discouraging **tobacco use**) can be implemented

very quickly via indirect taxes.

1.2) Quick implementation of indirect taxes also means that government revenues can be increased without significant additional costs

2) Disadvantages:

2.1) Direct taxes and transfer payments take time to implement 2.2) Capital spending also takes a long time to implement.

A “pay as you go” is a neutral policy.

The fiscal multiplier determines the potential increase in aggregate demand resulting from an increase in **government spending**:

$$\text{fiscal multiplier} = \frac{1}{1-MPC(1-t)}$$

(MPC = marginal propensity to consumer)

Balanced budget multiplier

$$= \text{Tax increase} * \text{MPC} * \text{fiscal multiplier} - \frac{\text{spending increase}}{1-MPC(1-t)}$$

A country’s debt ratio is the ratio of aggregate debt to GDP.

1) Arguments for being concerned with the size of the debt:

1.1) Higher deficits lead to higher future taxes. Higher future taxes will lead

to disincentives to work.

1.2) It may lead to government defaulting.

1.3) Crowding-out effect: government borrowing is taking the place of

private sector borrowing.

2) Arguments against being concerned with the size of fiscal deficit:

2.1) If domestic citizens primarily hold the debt, the scale of problem is overstated.

2.2) If the debt is used to finance productive capital investment, future economic gains will be sufficient to repay the debt.

2.3) Fiscal deficits may prompt needed tax reform.

2.4) Deficits would not matter if **private sector savings in anticipation of future tax liabilities just offsets the government deficit.**

Fiscal policy aim to stabilize aggregate demand

财政政策的滞后:

- 1) Recognition lag (**more frequent reporting**)
- 2) Action lag
- 3) Impact lag

宏观问题对财政政策的影响:

- 1) MisModule economic statistics
- 2) Crowding-out effect (*caused by deficit budget, also leads to an increase in interest rate and increase in private saving*)
- 3) Supply shortage
- 4) limits to deficits 赤字不能过高
- 5) Multiple targets: fiscal policy cannot address both high unemployment and high inflation.

An increase (decrease) in surplus (more saving than spending) is indicative of a contractionary (expansionary) fiscal policy.

Structural (or cyclically adjusted) budget deficit is used to gauge fiscal policy. This is the deficit that would occur based on current policies if the economy were at full employment

- 1) Expansionary fiscal and monetary policy
- 2) Contractionary fiscal and monetary policy
- 3) Expansionary fiscal policy + contractionary monetary policy
Aggregate demand will likely be high (due to fiscal policy), while interest rates will be higher. **Government spending** as a proportion of GDP will **increase**.
Higher government spending may lead to higher interest rate and lower private sector investing.
- 4) Contractionary fiscal policy + expansionary monetary policy

Interest rate will fall, government spending as a proportion of GDP will **decrease** due to fiscal policy. The private sector would grow as a result of low interest rate.

Module 6 International Trade and Capital Flows

Autarky or closed economy: A country that does not trade with other countries. Net exports = exports - imports

Foreign direct investment: ownership of productive resources (land, factories, natural resources) in a foreign country.

Multinational corporations

The benefits of international trade are greater than the costs for economies as a whole.

- 1) A country is said to have an absolute advantage in the production of a good if it can produce the good at **lower cost** in terms of resources than that of another country;
- 2) A country is said to have a comparative advantage in the production of a good if **its opportunity cost in terms of other goods that could be produced instead is lower than that of another country.**

If one country has a lower opportunity cost of producing one good, the other country must have a comparative advantage in the production of the other good. As long as their opportunity costs of production differ, two countries can both benefit from trade.

- 1) **The Ricardian model** of trade has only one factor of production – **labor**. The source of differences in production costs in Ricardo's model is differences in labor productivity due to **differences in technology**. **A country captures more of the gains from trade if the terms of trade are closer to its partner's autarkic prices than to its autarkic prices.**
- 2) **Heckscher and Ohlin** presented a model in which there are two factors of production – **capital and labor**. There is a redistribution of wealth within each country between labor and the owners of capital. The good that a country imports will fall in price (that is why they import it), and the good that a country exports will rise in price. In other words, **the abundant factor gains relative to the scarce factor in each country.**

- 1) 支持贸易壁垒成立的理论
1.1) Infant industry
1.2) National security
- 2) 支持贸易壁垒不成立的理论
2.1) Protecting domestic jobs: other jobs will be created, and prices will be lower.
2.2) Protecting domestic industries: consumers pay higher price.

Types of trade restrictions

1) tariffs 进口关税, 限制进口

Domestic producers gain, foreign exporters lose. 政府 gained by tariff revenue.

2) quotas 进口限额, 限制进口

2.1) if the domestic government collects the full value of the import licenses, the result is the same as for a tariff.

2.2) If the domestic government does not charge for the import licenses, this amount is a gain to those foreign exporters who receive the import license under the quota and are termed **quota rents**.

3) Voluntary export restraint: a country voluntarily restricts the amount of a good that can be exported, often in the hope of avoiding tariffs or quotas imposed by their trading partners.

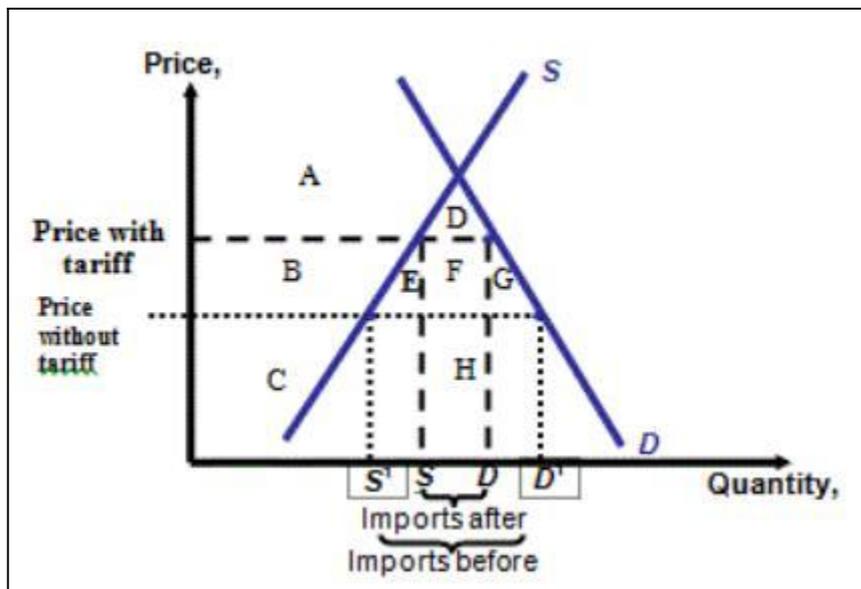
VERs is another way of protecting the domestic producers in the importing country. 限制出口

以上三种共有的特点:

Reduce imports; increases price; **decrease consumer surplus**; increase domestic quality supplied; **increase producer surplus**.

Quotas and tariffs in a large country could increase national welfare

under a specific set of assumptions. *In large country, setting a quota/tariff reduce the world price.*



$F =$ tariff revenue/quota rents

$B =$ producer surplus

$E + G =$ DWL

4) export subsidies 出口补贴, 鼓励出口

In small country, increase price, reduce consumer surplus, national welfare loss; in large country, the world price decreases, the foreign consumers benefits.

5) minimum domestic content 限制进口, 国内品牌至少占多少比重

Capital restrictions

Overall, in the long run, it is thought to decrease economic welfare. However, over short term, they have helped developing countries avoid the impact of capital flow fluctuations. On Balance, economic welfare is improved by reducing or eliminating trade restrictions.

Trading blocs/regional trading agreements (in order of their degrees of integration 越来越自由)

- 1) free trade areas 自由贸易区
 - 2) custom union 关税同盟 (all countries adopt a common set of trade restrictions with non-members)
 - 3) common market 欧洲共同体 (all barriers to the movement of labor and capital goods among member countries are removed)
 - 4) economic union 经济组织 (member countries establish common institutions and economic policy for the union)
 - 5) monetary union 货币联盟 (member countries adopt a single currency)
- The North American Free Trade Agreement (NAFTA, 北美自由贸易协议) is an example of a free trade area, while the European Union (EU) is an example of a monetary union.

Regional trading agreements are more popular than large multilateral trade agreements are because it has **quicker and easier policy coordination**.

The Balance of payments (国际收支平衡) includes:

- 1) **Current account** (flows of goods and services)
 - 1.1) **Merchandise** consists of all raw materials and manufactured goods
bought, sold, or given away. 商品
 - 1.2) **Services** include tourism, transportation, and business and engineering services, as well as fees from patents and copyrights on new technology. 服务
 - 1.3) **Income receipts** include foreign income from dividends. 股息红利
 - 1.4) **Unilateral transfers** are one-way transfers of assets, such as money

received from those working abroad and direct foreign aid.

Example of current account:

Bought raw material from Indonesia

Sold food products to France

Received royalty fees from its branch in the United Kingdom

Donated to charitable institution in Africa

Paid legal fees to its German legal consultant company

Received coupon from its investment in Eurobonds issued in Luxembourg

2) **Capital account** (capital transfers and the acquisition and disposal of non-produced, non-financial assets)

2.1) Capital transfer includes debt forgiveness and goods and financial

assets that migrants bring when they come to a country or take with them when they leave. Capital transfer also include the transfer of title to fixed assets and of funds linked to the purchase or sale of fixed assets, gift and inheritance taxes, death duties, and uninsured damage to fixed assets.

2.2) Sales and purchases of non-financial assets that are not produced

assets included **rights to natural resources and intangible assets**, such as patents, copyrights, trademarks, franchises, and leases.

3) **Financial account** (records investment flows)

3.1) government-owned assets abroad (在国外的国有资产) include gold, foreign currencies, foreign securities, reserve position in the IMF, credits and other long-term assets, foreign direct investments, and claims against foreign banks.

3.2) foreign-owned assets in the country (在本国的外国资产) are divided into foreign official assets and other foreign assets in the domestic country.

Example of Financial account:

Borrowed from a bank in Singapore

A country that has imports valued more than its exports is said to have a **current account/trade deficit**, which must be balanced by a net surplus in the capital and financial accounts. 进口多于出口，称为赤字。

$X-M = \text{private savings} + \text{government savings} - \text{investment}$

出口-进口，赤字减小则出口增加，进口减少，则储蓄增加，投资减少

If a country's net savings are less than the amount of investment in domestic capital, foreign borrowing must finance this investment. Foreign borrowing results in a capital account surplus, which means there is a trade deficit.

如果前两项过低，那么借外债不能提高未来生产力；
如果最后一项过高，那么借外债还能提高未来生产力。

- 1) IMF
- 2) World Bank: **provide help to developing countries.** WB is made up of two units: the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA). **IBRD aims to reduce poverty in middle-income, while IDA focuses on the world's poorest countries.** Together, WB provides **low-interest loans, interest-free credits**
- 3) WTO: only international organization dealing with the global rules of trade between nations. Its main function is to ensure **that trade flows** are smoothly, predictably and freely as possible. **Multilateral trading system**
- 4) General Agreement on Tariffs and Trade (**GATT**) was the only multilateral body governing international trade from 1948 to 1995. It operated for almost half a century as a quasi-institutionalized, provisional system of multilateral treaties and included several rounds of negotiations.

Module 7 Currency Exchange Rates☆☆☆

Nominal exchange rate (d/f) = Real exchange rate (d/f) $\left(\frac{CPI_d}{CPI_f}\right)$

A spot exchange rate is the currency exchange rate for immediate delivery, which for most currencies means the exchange of currencies take place two days after the trade.

Direct exchange rate: domestic currency / foreign currency

Indirect exchange rate: foreign currency / domestic currency

FX sell-side: large multinational banks

FX buy-side:

- 1) Corporations
- 2) Investment accounts

2.1) Real money accounts: mutual funds, pension funds, insurance companies, and other institutional accounts that do not use derivatives

2.2) leveraged accounts: hedge funds

3) Governments and government entities, including sovereign wealth funds and pension funds.

4) The retail market

Appreciate/depreciate 都是针对 base currency 来说的

Cross rates are necessary when there is no active FX market in the currency pair. 注意题目中 points 即指 basis points

For spot and forward rates expressed as domestic/foreign, the interest rate parity (利率平价理论) is:

$$\frac{\text{Forward} (1 + \text{interest rate}_{\text{domestic}})}{\text{Spot} (1 + \text{interest rate}_{\text{foreign}})}$$

The forward discount or forward premium for a currency is calculated relative to the spot exchange rate.

A forward premium indicates the interest rate is higher in the price currency than in the base currency.

The trade surplus cannot decline unless the capital account deficit also declines.

An ideal currency regime would have credibly fixed exchange rates among all currencies. This would eliminate currency-related uncertainty with respect to the prices of goods and services as well as real and financial assets.

Exchange rate regimes 汇率管理体制

1) Countries that do not have their own currency

1.1) Use the currency of another country (**formal dollarization**)

1.2) A member of monetary union (EU)

2. Countries that have their own currency

2.1) Currency board arrangement 香港(**does not act as lender of last resort**)

The monetary authority is legally required to hold foreign exchange reserves backing 100% of its domestic currency issuance.

- 2.2) conventional fixed peg arrangement 盯住汇率制度, 可以直接干预或者间接干预, *allows for a small degree of fluctuation around the target exchange rate.*
- 2.3) In a system of pegged exchange rates within a target zone
- 2.4) Crawling peg 浮动盯住汇率制
- 2.5) With management of exchange rates within crawling bands
- 2.6) With a system of managed floating exchange rates
- 2.7) Independently floating

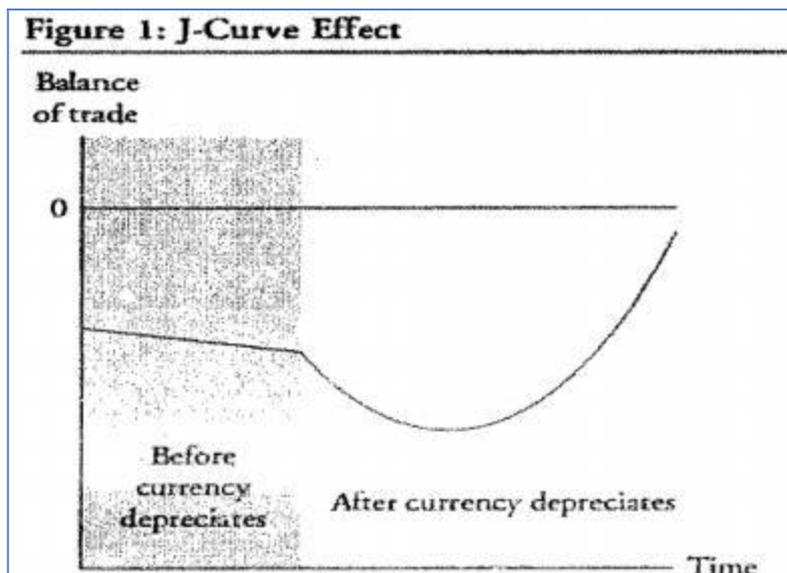
The effects of exchange rates on countries' international trade and capital flows:

- 1) Elasticity approach (缺点是只考虑了微观方面): focus on the impact of import and export.

The conditions under which a depreciation of the domestic currency will decrease a trade deficit are given in what is called the **generalized Marshall-Lerner condition**.

总结: currency depreciation will have a greater effect on the **trade balance** when import or export goods are primarily **luxury goods, goods with close substitutes, and goods that represent a large proportion of overall spending**. The more elastic both import demand and export demand are, the more likely currency depreciation is to narrow a trade deficit.

J-curve, import and export quantities may be relatively insensitive to currency depreciation in the short run, which means currency depreciation may worsen a trade deficit initially.



- 2) Absorption approach(宏观工具): focus on capital flows

2.1) When an economy is operating at less than full employment, the currency depreciation **improves** the balance of trade.

2.2) When the economy is operating at full employment, the currency depreciation initially improves the balance of trade, but eventually return the economy to its previous state balance of trade.

Long-term improvements in the trade deficit require either an improvement in the fiscal deficit or an increase in the excess of domestic savings over domestic investments.

Financial Statements Analysis

Module 1 Introduction to Financial Statement

Analysis

Six steps in financial statement analysis framework:

- 1) State the objectives and context
- 2) Gather data
- 3) Process the data
- 4) Analyze and interpret the data
- 5) Report the conclusions or recommendations
- 6) Update the analysis

The statement of comprehensive income reports all changes in equity except for shareholder transactions (issuing stocks, repurchase stocks and paying dividends)

Under IFRS, income statement and other comprehensive income statement can be combined as comprehensive income; alternatively, they can be reported separately; *Under IFRS, the statement of comprehensive income (=profit after tax + OCI) begins with the profit or loss from the income statement.*

Under GAAP, firm can also report comprehensive income in the statement of shareholder's equity. OCI 也可以写在 the statement of shareholder's equity 里

Footnotes: fiscal period, **accounting methods**, assumptions, and **estimates** used by management, business acquisitions or disposals, legal actions, employee benefit plans, contingencies and

commitments, significant customers, sales to related parties, and segments of the firms.

MD&A: some parts may be unaudited.

- 1) Past performance and future outlook
- 2) For firms in US, SEC requires: trends and significant events and uncertainties, effect of inflation.
- 3) Off-balance-sheet obligations, forward-looking expenditures and divestitures.
- 4) **Significant accounting policies and estimates that require management judgment.** Likely impact of implementing recently issued accounting standards

Standard auditor's opinion

- 1) Independent
- 2) No material errors
- 3) Correct accounting principles
- 4) Express opinions on internal control (under GAAP)

Auditors' opinion:

- 1) unqualified opinion 无保留意见,指完全正确
- 2) qualified opinion 保留意见(失当), the statement make any exceptions to the accounting policies.
- 3) adverse opinion 反面意见(完全错误), statements are not fair or nonconforming with accounting standards.
- 4) disclaimer of opinion 无法表示意见, in the case of a **scope limitation**.
- 5) An explanatory paragraph when a material loss is probable but the amount cannot be reasonably estimated. 非常严重的问题

*For a company issuing securities in the United States to meet its obligations under the **Sarbanes-Oxley Act**, it is mandatory that management's Report to Shareholders and discusses **internal financial controls** and their effectiveness, as well as the company's **auditor's opinion of these internal controls**.*

Quarterly or semiannually reports (**interim report, to update info on performance and financial position**) are not necessarily audited.

Form 8-K, M&A and disposals.

Form 10-K, annual report

Form 10-Q, quarterly report

Proxy statements: shareholder vote, election of board members, compensation, management qualifications, and the issuance of stock options.

Prepaid expense, 先发生 - 的 cash, 则增加的 prepaid expense 属于 asset.

Unearned revenue, 先发生 + 的 cash, 则增加的 unearned revenue 属于 liability. 以下两个好记忆, 然后再考虑以上两个

Accrued expense: 费用先录入, 则 net income 下降, 则增加的属于 liability.

Accrued revenue: 收入先录入, 则 net income 上升, 则增加的属于 asset.

Revenue: Investment income such as interest and dividend income.

Assets = liabilities + contributed capital (包括初始和期间发行的) + beginning retained earnings + revenues - expenses - dividends

Ending Retained Earning = Beginning Retained Earning + Net income - Dividends = Total equity - contributed equity

Accrual accounting: revenue is recorded when the firm earns it and expenses are recorded as the firm incurs them, regardless of whether cash has actually been paid.

Contra account: accumulated depreciation, allowance for bad debts (相对于 accounts receivable)

判断如何记账:

- 1) 先判断 cash 是先交换还是后交换 Unearned revenue(L) and prepaid expense(A), cash changes hands first; accrued revenue(A) and accrued expense(L), the revenue or expense is recorded first and cash is exchanged later.
- 2) 再判断是提供(revenue)还是接受服务(expense)

Module 2 Financial Reporting Standards

Depreciation expense: group by nature of the expense

COGS: group by function

Standard-setting bodies: FABS (US GAAP) and IASB (IFRS) 制定准则

Regulatory authorities: SEC and FSA (PRA) 督促执行, established by national government

Most national authorities (including SEC and FSA) belong to the International Organization of Securities Commissions (IOSC, 国际证券业协会).

The goal: uniform financial regulations across countries

Three objectives:

- 1) Protect investors
- 2) Ensure the fairness, efficiency, and transparency of markets

3) Reduce systematic risk

Form S-1, 证券 IPO 前登记

Form 10-K, 公司年度报告. For Canadian companies in the US market, form 40-F; other foreign issuers in US market, form 20-F.

Form 10-Q, 季度报告, 还有 disclosure about legal proceedings or changes in accounting policy.

Form DEF-14A, 即 **proxy statement**.

Form 8-K, **M&A and disposals**, change in the management board, or matters related to its accountants, its financial statements, or the markets in which its securities trade.

Form 144, 可以不用注册就发行证券给特定买家, 但是要告诉事先告诉 SEC. Form 3, 4 and 5, 公司内部人员购买公司股票.

Two important underlying assumptions of financial statements are **accrual accounting and going concern**.

IFRS specifies a number of general features underlying the preparation of financial statements:

- 1) Materiality
- 2) Accrual basis
- 3) Fair presentation
- 4) Going concern
- 5) Consistency
- 6) Aggregation
- 7) No offsetting
- 8) Comparative info
- 9) Report frequency at least annually

IASB's conceptual framework

Qualitative characteristics

1) Relevance

S) Faithful representation

Four characteristics that enhance above characteristics (CVTU):

- 1) **Comparability:** financial statement should be consistent among firms and across time periods.
- S) **Verifiability:** independent observers, using the same method, obtain similar results.
- 3) **Timeliness**
- 4) **Understandability**

Constraints and assumptions:

- 1) Cost-benefit tradeoff
- 2) Non-quantifiable information cannot be captured

Required financial statement under IAS No.1

- 1) Balance Sheet
 - 2) Statement of comprehensive income
 - 3) Cash flow statement
 - 4) **Statement of changes in owners' equity**
 - 5) **Explanatory notes**, including a summary of accounting policies
- FASB (GAAAP) does not allow the upward valuation of most assets.

Coherent financial reporting framework should be (TCC):

- 1) **Transparent**
- 2) **Comprehensive**
- 3) **Consistent**

Barriers:

- 1) Valuation
- 2) Standard setting:
 - 2.1) principles-based (基于原则, IFRS)
 - 2.2) rules-based (基于规则, GAAP)
 - 2.3) **objectives-oriented** (目标导向, 两者共同努力的方向)
- 3) measurement 以 B/S 还是 I/S 为准呢? 以 B/S 为准

Module 3 Understanding Income Statements☆☆☆

Net revenue = revenue – estimated returns and allowance (销售退回和折扣)
Net Income = revenues – ordinary expenses + other income – other expense + gains – losses

Non-controlling interest (minority interest or minority owners' interest), 是指母 公司不对子公司控制的部分, 应将其从 net income 中减掉
If A owns more than 50% of B, then it must include 100% of B's revenues.

Interest expense is an operating expense for financial firms and a financing expense for non-financial firms.

收入确认 (revenue recognition policies are disclosed in footnotes)

- 1) According to IASB, revenue is recognized when
 - 1.1) The risk and reward of ownership is transferred**
 - 1.2) Revenue can be readily measured
 - 1.3) There is a probable flow of economic benefits
 - 1.4) The cost can be reliably measured**

- 2) According to FASB, revenue is recognized when (标准更加严格)
 - 2.1) Realized or realizable and
 - 2.2) Earned
- 3) SEC provides additional guidance; revenue is recognized when
 - 3.1) Evidence of an arrangement between the buyer and seller
 - 3.2) Product has been delivered or the service has been rendered
 - 3.3) Price is determined
 - 3.4) Seller is sure of collecting money

特殊收入确认

Long-Term Contracts

- 1) When the outcome can be reliably estimated:

The percentage-of-completion method is used both under IFRS and GAAP (more aggressive, more subjective, smoother earnings).

- 2) When the outcome cannot be reliably estimated:

- 2.1) Under IFRS, revenue is same as cost, **only recognize profit in the final period.**

- 2.2) Under GAAP, complete-contract-method is used. **All revenue, expense, and profit are recorded in the final period.**

If a loss is expected, the loss must be recognized immediately under IFRS and GAAP.

Installment Sales

很少用, 只用在卖房产和其他公司资产, 当回收性不确定时.

$\text{Profit} = (\text{cash collected}/\text{sales}) * \text{total expected profit}$

Cost recovery method

Profit is recognized only when cash collected exceeds costs incurred. 用在回收 性特别不确定时.

Barter transactions

Under GAAP, revenue from a barter transaction can be recognized at **fair value** only if the firm has **historically received cash payments for such goods and services** and can use this historical experience to determine fair value. **Otherwise, the revenue is recorded at the carrying value of the asset surrendered.**

Under IFRS, revenue must be based on the **fair value** of the revenue from similar non-barter transactions with unrelated parties.

To use gross reporting of revenue under GAAP, the firm must:

- 1) Be the primary obligor under the contract

- 2) Bear the inventory risk and credit risk
- 3) Be able to choose its supplier
- 4) Have reasonable latitude to establish the price

费用确认

Matching principle: **expense follows revenue**, except for period cost, such as administrative costs.

FIFO and average cost are permitted under both GAAP and IFRS.
LIFO is allowed under GAAP but is prohibited under IFRS.

1) Depreciation (tangible assets)

Straight-line depreciation and Double-declining depreciation

2) Depletion (natural resources)

3) **Amortization (intangible assets)**. Goodwill (indefinite lives) is not amortized, but they must be tested for impairment **at least annually**. If impaired, an expense equal to the impairment must be recorded in income statement.

4) Bad debt expense (坏账费用) and warranty expense (质保费用) recognition. **Recognize the revenue/expense at the time of the sale and update the expense over the life of the warranty.**

Declining Balance method: apply a constant rate of depreciation to an asset's book value each year.

$$DDB = \frac{2}{\text{useful life}} * (\text{cost} - \text{accumulated depreciation})$$

Non-Recurring Items

- 1) Measurement date: the firm develops a formal plan for disposing of an operation
- 2) Phase-out period: the time between the measurement period and the actual disposal date.

针对 discontinuing operations (**net of tax, after income from continuing operations, should be excluded when forecasting future earnings**), 过去的都要 restate. On the measurement date, the company will accrue loss, but any gain (**累计损失, 不计利润**) cannot be reported until after the sale is completed.

The disposition of a capital asset is reported as a net gain or loss on the income statement before tax effects.

Unusual or infrequent items (included in income from continuing operations, reported before tax):

- 1) Profit/loss from sale of assets
- 2) Impairments, write-offs, write-downs, and restructuring costs. Extraordinary items (**under GAAP: net of tax, after income from continuing operations; under IFRS, do not permit classification of an item as extraordinary.**)

- 1) Losses from an expropriation of assets. 财产罚没
- 2) Profit/loss from early retirement of debt
- 3) Uninsured losses from Natural disasters

Changes in accounting standards

- 1) Change in accounting principles (**from LIFO to FIFO**) need to restate.
- 2) Change from incorrect accounting method or the correction of an accounting error, called Prior-Period adjustments, **need to restate and disclosure of the nature of the adjustment and its effect on net income. Do not affect cash flow.**
- 3) Change in accounting estimate (due to new information), **no restate. Do not affect cash flow, but do affect future operating results.**

EPS refers to the per-share earnings available to common shareholders.

A simple capital structure: common stock, nonconvertible debt, and nonconvertible preferred stock. 如果没有 convertible shares, or convertible debt,

or option/warrants, 则 diluted EPS = basic EPS =
$$\frac{\text{net income} - \text{preferred div}}{\text{number of shares}}$$

在分子上, 只要是 preferred dividend, 均被减, 不管是否 convertible/nonconvertible diluted EPS 分子上, 注意 preferred dividend 被减掉又加回, 没有影响。

发生 stock dividend 和 stock split, 对之前的股票数先进行调整 convertible preferred stock, convertible bonds 对分子分母均有影响;

stock options, warrants 只对分母有影响 (strike price < average market price)

注意只有 convertible preferred stock 才 dilute, unconvertible 或者 cumulative 均不 考虑

Any transaction that affects net income will also affect equity. Comprehensive income = net income + other comprehensive income Other Comprehensive Income

- 1) FX translation gains and losses.
- 2) Adjustments for minimum pension liability

- 3) Unrealized profit/loss from cash flow hedging derivative.
- 4) Unrealized profit/loss from available-for-sale securities (reported as fair value).

Module 4 Understanding Balance Sheets

Both IFRS and GAAP require firms to separately report current/noncurrent assets/liabilities (known as **classified balance sheet**).

IFRS does not specify the order of presentation of current and noncurrent assets. Under U.S. GAAP, current assets are presented before long-term assets and current liabilities before long-term ones.

Liquidity-based format is often used in the banking industry, presenting assets and liabilities in the order of liquidity.

Current assets > reveal information about the operating activity
Working capital = current assets – current liabilities (不要太多或太少)

Noncurrent assets > provide information about the **investing activities**
Noncurrent liabilities > provide information about long term **financing activities**

Accrued liabilities (应计费用) include income tax payable, interest payable, wages payable, etc.

All advertising and promotion costs, such as media placements, are typically expensed.

Non-current asset

1) PPE (property, plant and equipment). **Under IFRS, cost model or revaluation model; under GAAP, only cost model is allowed.**

Cost model: PPE other than land is reported at amortized cost (historical cost – depreciation). Land is not depreciated as it has indefinite life.

1.1 **The cost model** (both IFRS and GAAP, but the steps are slightly different as illustrated [here](#)), PPE must be tested for impairment. **Under IFRS**, recoverable amount = max (FV-selling cost, value in use (PV of cash flow)).

If the carrying value exceeds the recoverable amount, the asset is impaired and written down to recoverable amount

and loss is recognized in the income statement. Loss recoveries are allowed under IFRS but not GAAP.

Under GAAP, 只有发生了 bad situations 才评估(更实在).

Two steps, firstly, recoverability test, 看 carrying value 是否大于 future undiscounted cash flow. Secondly, loss measurement, 这里使用 fair value 或者 future discounted cash flow. Loss recovery is not allowed.

1.2 Revaluation model (under IFRS): PPE is reported at FV-depreciation. Changes in FV are reflected in shareholders' equity and may be recognized in the income statement.

To be more specific, 任何高于历史成本的重新成本不能计入 gain, instead, it is reported in **revaluation surplus** in shareholder's equity. 之后若减少,先少 surplus, 减到低于历史成本,再计亏损.用重新估计模型后,就不计入折旧,任何资产的减少会 reduce fair value.

2) Investment property, under IFRS, a firm can use cost model (和普通 PP&E 一样) or fair value (if can be estimated reliably) to value investment property. 这个 fair value 和 PP&E 的 revaluation model 有点不一样的.

IFRS 区分 investment property, 但是 GAAP 不做区分

3) Intangible assets:

3.1) Identifiable: patents, trademarks, and copyrights.

Under IFRS, purchased identifiable intangibles can use the **cost model or the revaluation model** (only when an active market exists);

Under GAAP, only cost model is allowed, must be valued at historic cost.

3.2) Unidentifiable: Goodwill (=purchase price - FV of identifiable net assets), only created in a purchase acquisition. **Internally generated goodwill is expensed as incurred.**

Economic goodwill (经济商誉) derives from the expected future performance of the firm, while accounting goodwill is the result of past acquisitions.

Intangible assets with finite life, amortized and tested for impairment, the

amortization method and useful life estimates are reviewed at least annually.

Intangible assets with infinite lives are not amortized, but **tested for impairment at least annually.** For example, if impaired, goodwill is reduced and a loss is recognized. **The impairment loss does not affect cash flow.** Trademark (商标) 有失效期,但是可以极小成本 renew,所以看作 have an indefinite life and no amortization required.

4) Financial assets

*Bonds payable issued by a company are financial liabilities that are usually measured at **amortized cost**.*

Historical Cost	Amortized cost	Fair value (MTM)
Unlisted equity investment	Held-to-maturity Securities (除非变卖, 不然忽略MV 的变化, 所谓的unrealized pnl 不计入任何表)	Trading securities and derivatives, unrealized profit/loss is recognized in the income statement
Loans and receivables		Under IFRS/GAAP, Available-for-sale security, any unrealized profit/loss are reported as OCI as part of shareholder's equity.
	Dividend and interest income and realized profit/loss are recognized in the income statement.	

Non-current liabilities

1) Long-term financial liability

2) Deferred tax liabilities
 Owners' equity

1) Contributed capital
 (issued capital)

Authorized shares (授权的股数)
 Issued shares

Outstanding shares = issued shares – treasury stock
 (reacquired by the firm)

2) Preferred stock, can be equity (perpetual preferred stock) or debt

3) Non-controlling interest

4) Retained earnings

2) Treasury stock, reduced stockholders' equity, has **no voting rights and does not receive dividends.**

6) Accumulated other comprehensive income

6.1) Unrealized pnl from available-for-sale securities

6.2) Cash flow hedging activities

6.3) FX translation

6.4) Minimum pension liability

A vertical common-size income statement: as a percentage of **revenue**. This allows for time-series analysis and cross-sectional analysis.

A vertical common-size balance sheet, expressed as a percentage of **total assets**, which allows for time-series analysis and cross-sectional analysis.

Current ratio = current assets / current liabilities

The quick ratio is calculated by **excluding inventory** from current assets. Cash ratio **excluded both inventory and receivables**.

When calculating the solvency ratios, **debt is considered to be any interest-bearing obligation**.

When calculating the financial leverage ratio (**total debt-to-equity = total assets / total equity**; long-term debt-to-equity = long-term debt / total equity) captures **both interest bearing and non-interest bearing**.

The issuers report as liabilities any financial instruments that will require repayment of principal in the future. Mandatory redeemable preferred shares (which used to be reported as equity) now must be reported as debt; dividends on such stock must be reported as interest expense. (Consistent with the view that the preferred stock is debt)

Module 5 Understanding Cash Flow Statements



CF statement is not used to determine a company's monthly cash budget.

CFO affects a firm's net income.

CFI consists of cash flow resulting from the acquisition or disposal of long-term assets and certain investments.

CFF affects a firm's capital structure.

Noncash investing and financing activities are not reported in the cash flow statement since they do not result in inflows or outflows of cash. Noncash transactions must be disclosed in either **footnote or supplemental schedule** to the cash flow statement. **Some examples:**

- 1) The firm acquires real estates with financing provided by the seller
- 2) An exchange of debt for equity

- 3) The exchange of non-monetary assets or issuance of stock as part of a stock dividend or conversion
- 4) Exchange stock
- 5) Write off/impairment of assets
- 6) Debt retired through issuance of stock

Under US GAAP:

CFF: 发行 / 回购股票债券, 支付红利;

CFI: 变卖 / 收购固定资产, 股票债券; 贷款;

CFO: 客户现金流, 税收支付, 买卖 trading securities

Items	GAAP (only)	IFRS (either)
Dividends paid	CFF	CFO/CFF
Interest paid	CFO	CFO/CFF
Dividends/Interest received	CFO	CFO/CFI
Income tax paid	CFO	CFO unless the expense is associated with investing or financing activities
Payments for interest and tax	Report in Cash flow statement or disclose in footnote	Must be disclosed separately in the cash flow statement under either method

Both direct and indirect methods are permitted under GAAP and IFRS (**都鼓励用 Direct method**). Most firms use **indirect** method (because under GAAP, if you use direct, then you need to reconcile to indirect; same are not required under IFRS). Direct method provides more information than indirect method. Advantage of indirect method is that it focuses on the differences in net income and operating cash flow. This provides a useful link to the income statement when forecasting future CFO.
 Beginning accounts receivable + sales – Cash collections =
 Ending accounts receivable

Indirect methods

CFO = Net income + depreciation and amortization – profit from sale of assets – increase in accounts receivable – increase in inventory + increase in accounts payable + increase in accrued liabilities

Direct method

1) CFI

Cash paid for new assets (buy assets):

Beginning assets + cash paid for new assets – cost of assets

sold = Ending assets Cash from assets sold (sell assets):

Beginning assets – Ending assets + profit/loss on sale = Cash

from assets sold 2) CFF (sum of below two measures)

Cash flow from creditors = net borrowing – principal amounts repaid

Cash flow from shareholders = new equity issued – share repurchased – cash dividends paid (calculated from dividends declared and any changes in dividends payable)

Convert cash flows from the indirect to direct method (按照 sources or uses of cash 来判断是+ 还是-)

1) Cash collections from customers (+现金流) = sales - increase in accounts receivable + increase in unearned revenue

2) Cash payments to suppliers (-现金流) = COGS + depreciation – increase in accounts payable + increase in inventory – inventory write-off

3) Cash received from sale of equipment = Book Value + profit/loss from the sale

Book Value = historic cost – depreciation

4) Cash paid for interest = interest expense + decrease in interest expense Over the long term, CFO > capital expenditure

CFO can be increased by real earning-related activities or liquidating inventory / receivables or increasing payables.

Stable CFO/Net income ratio is good.

CFI, 通过卖资产获得的 CFI 增加不可持续

1) FCFF = Net income + depreciation + interest expense * (1-tax rate) – fixed capital investment – working capital (net income 包括了 depreciation 和 WC, 所以要减掉)

2) More importantly,

FCFF = CFO + interest expense * (1-tax rate) – Fixed Capital Investment (如果 interest 不包含在 CFO 中, 则不用 add back)

其中, Fixed Capital Investment = cash spent on fixed assets – cash received from selling fixed assets

3) FCFE = CFO + net borrowing (debt issued – debt repaid) – fixed capital investment

Module 6 Financial Analysis Techniques☆☆☆

During the process data phase, an analyst will produce a variety of reports and documents based on the information collected. These may include common-size statements, ratios and graphs, forecasts, adjusted statements, and analytical results. Assessment of performance includes analysis of profitability and cash flow generating ability. The relationship between assets and liabilities is used to assess a company's financial position, not its performance

Ratio analysis: 发现问题

- 1) Common-Size analysis
 - 1.1) Vertical: time-series analysis and cross-sectional analysis
 - 1.2) Horizontal: the divisor is the first-year values
- 2) Graphical Analysis
 - 2.1) Stacked column graph
 - 2.2) Line graph
- 3) Regression analysis: used for forecasting

$$ROE = \frac{\text{net income}}{EBT} \times \frac{EBT}{EBIT} \times \frac{EBIT}{\text{revenue}} \times \frac{\text{revenue}}{\text{total assets}} \times \frac{\text{total assets}}{\text{total equity}}$$

Above formula shows that **more leverage does not always lead to higher ROE**. The second and last item could offset each other. However, **higher taxes will lead to lower levels of ROE**.

Activity ratio: 各种turnover, 等同于performance ratio, 类似于是否 efficient

Liquidity ratio: 各种关于cash, 包括defensive interval

Solvency ratio: 各种关于debt, 比如debt/capital, interest coverage

Profitability ratio: such as net profit margin

Defensive interval = (cash + marketable securities + receivables)/average daily expenditure

Debt-to-capital ratio = total debt / (total debt + total shareholder's equity) 这里total debt 指short term and long term debt, 不包括其他liability

Total capital = total assets

Capital equals to all short-term and long-term debt plus preferred stock and equity.

Coefficient of variation = standard deviation / mean (**注意这里都用 arithmetic mean return 而不是geometric mean return**)

Z-score: a low score indicates high probability of failure

Module 7 Inventories☆☆☆

Ending inventory = Beginning inventory + Purchase (in) – COGS (out)

- 1) **Product costs** capitalized in the inventories account(包括原材料和运输成本):
 - 1.1) Purchase cost **less** trade discounts and rebates.
 - 1.2) Conversion costs including **labor and overhead** (生产和原材料成本).
 - 1.3) Other costs to bring the inventory to the location(运输成本). 比如
import duties.
- 2) **Period costs** are expensed in the period occurred:
 - 2.1) **Abnormal waste** of materials, labor, or overhead.
 - 2.2) **Storage costs** (unless required as part of production)
 - 2.3) Administrative overhead 管理费用
 - 2.4) Selling cost (销售费用, shipping to customers)

In a periodic inventory system, inventory values and COGS are determined **at the end of the accounting period.**

In a perpetual inventory system, inventory values and COGS are **updated continuously.**

Under above two systems, it could produce different values under LIFO and weighted average cost methods (same under FIFO).

LIFO firms are less likely to recognize inventory write down than firms using FIFO or weighted average cost. (因为 ending inventory 的 cost 比较低,所以减计 的可能性就比较小) please see below:

Assume increasing prices and stable or increasing inventory levels.

	FIFO	LIFO
COGS	Lower	Higher
Ending Inventory	Higher	Lower
Gross Profit	Higher	Lower

With rising price, LIFO produces higher COGS and result in lower earnings. Any profitability measure that includes COGS will be lower under LIFO, such as gross, operating, and gross profit margins.

Quick ratio is unaffected by the inventory cost flow method because inventory is excluded from its numerator.

以下为 Cost 和 NRV/MV 相比较。例外是 under GAAP/IFRS, report inventory at NRV (above historic cost) for commodity-like products(农产品, 矿产, 贵金属)

1) Under IFRS, inventories = min (cost, NRV)

NRV = sale price - selling cost

NRV formulas regards to tangible assets are here.

1.1) If NRV is less than the carrying value, the inventory is written down to NRV and a loss is recognized in the income statement.

1.2) If there is a recovery of value, it can be written back up and The gain is recognized in the income statement by reducing COGS by the amount of the recovery. Inventory cannot be written up by more than the amount it was previously written down (through valuation allowance account).

以成本计价, 若 NRV 低于成本, 则减计; 若 NRV 恢复, 则 write up

2) Under GAAP, inventories = min (cost, MV)

NRV - normal profit margin < MV = replacement value < NRV

If cost exceeds MV, the inventory is written down to MV and a loss is recognized in the IS. No write-up is allowed under GAAP; the firm simply reports higher profit when the inventory is sold.

简单来说, 以成本计价, 若高于 MV, 则 write down to MV.

Inventory disclosures can be found in footnotes. Required disclosures are:

1) LIFO/FIFO method?

2) Carrying value of inventories (包括作为担保的标的)

3) Write-down and any reversals

Under IFRS, change in cash flow method will need to restate prior-period data; Under GAAP, 当一家公司的 inventory method 变成 LIFO, 不需要 restate; 其他情况也都需要 restate.

Generally, higher inventory turnover is desirable. 但是也不能太高, 意味着存货可能不够, 也可能意味着发生了 inventory write-down.

Higherturnover 和 slower growth 就意味着存货不够.

Higherturnover 和 higher growth 就意味着存货管理相当好.

Higher gross profit margin 常发生在奢侈品行业, with lower inventory turnover

Module 8 Long-lived Assets☆☆☆

Purchase, installation and rebuilt costs are capitalized,

Initial training and repair and maintenance costs are expense when incurred.

$$\text{SL: Depreciation} = \frac{\text{cost} - \text{residual value}}{\text{useful life}}$$

$$\text{DDB: Depreciation} = \frac{(\text{cost} - \text{depreciation})}{\text{useful life}} * 2$$

$$\text{Unit of production: Depreciation} = (\text{cost} - \text{residual value}) * \frac{\text{Unit}}{\text{total}}$$

Capitalizing expenditure will result in higher CFO and lower CFI compared to expensing. **Depreciation is a noncash expense and does not affect CFO** (aside from any tax effect).

Capitalized interest (记作 CFI): the interest rate used to capitalize interest is based on debt specially related to the construction of the asset. If no construction debt is outstanding, then it based on existing unrelated borrowing.

只有建造部分的利息被资本化,超过建造成本的利息被 expense.

Under IFRS, 短期投资基金的收入可以用来减少该资本化的利息; Under GAAP, this is not allowed.

Capitalized interest (CFI) 不在 interest expense (CFO) 里,而在 depreciation expense (asset is held for use) or COGS (asset is held for sale).

Intangible assets

1) Created internally, costs are usually expensed. The only exception is development cost under IFRS, which may be capitalized. (under GAAP, R&D costs are expensed as incurred >zero carrying value)

However,到了 software 相关的时候, development costs 的情况又有所不同.研发初期(cost are expensed), 证实可卖(costs are capitalized).

The only exception is when the software is for self-use under GAAP all costs are capitalized.

Details can be found in table below:

	IFRS	GAAP
软件开发销售	研发初期(cost are expensed) 证实可卖(costs are capitalized)	研发初期(cost are expensed) 证实可卖(costs are capitalized)

软件开发自用	研发初期(cost are expensed) 证实可卖(costs are capitalized)	All capitalized
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2) Purchased intangible asset

Recorded on the balance sheet at cost, typically **fair value** at acquisition 3) Obtained in a business combination (**acquisition method is used**)

Goodwill is said to be an unidentifiable asset that cannot be separated from the business itself.

Only goodwill created in a business combination is capitalized on balance sheet. Internally generated goodwill is expensed.

4) A trademark that may have a specific expiration date, but can be renewed at minimal cost.

A change in an accounting estimate, **such as useful life and salvage value**, is put into effect in the current period and **no need to restate** prior periods. Component depreciation is allowed **both** under IFRS and GAAP (seldom used). PP&E (revaluation model and cost model)

Under GAAP and IFRS, **most long-lived assets are reported at depreciated cost** (cost model, **成本减去折旧**). Revaluation model is not allowed under GAAP (**只能用 cost model**).

Revaluation impact on profit/loss recognition (PP&E and investment property) Under IFRS, it also allows revaluation model (只要这个资产存在交易市场, 就可以使用 fair value). 任何高于历史成本的重新成本不能计入 gain, instead, it is reported in **revaluation surplus** in shareholder's equity. 之后若减少, 先少 surplus, 减到低于历史成本, 再计亏损. 用重新估计模型后, 就不计入折旧, 任何资产的减少会 reduce fair value.

For investment property, 只能用 FV model, 不用 revaluation surplus, revaluation above historic cost is recognized as a gain on the income statement.

Impairment of **tangible and intangible assets with finite lives that are held for use**

1) Under IFRS, tested annually, $NRV = \max [FV - \text{selling costs, value in use}]$. The loss can be reversed. Value in use 可以用 PV of future CF.

(carrying value = original cost – accumulated depreciation 和 NRV 相比)

- 2) Under GAAP, 只有发生了 bad situations 才评估(更实在).分两步
 - 2.1) recoverability test, 看 carrying value 是否大于 future undiscounted cash flow.
 - 2.2) loss measurement, 这里使用 fair value 或者 future discounted cash flow. Loss recovery is not allowed.

If a firm reclassifies a long-lived asset from held-for-use to held-for-sale, the asset is tested for impairment and ceased to depreciate. For assets that are held for sale, the loss can be reversed under IFRS and GAAP.

If abandoned or exchanged, then classified as held for use until disposal and continue to be depreciated.

长期资产最终会从资产负债表中移除

- 1) Sold. Asset is removed and profit/loss is recognized in income statement.
- 2) Abandoned. 同 1),全部亏损
- 3) Exchanged for another asset. The carrying value of the old asset is removed and the new asset is recorded at its fair value. A gain or loss is computed by the two values.

	IFRS	GAAP
PP&E	1) Useful life or depreciation rate 2) Carrying value and accumulated depreciation 3) Reconcile of carrying value from the beginning to end period 4) Assets pledged as collateral 5) Agreements to acquire PP&E in the future 6) If revaluation model is used, then the revaluation date, fair value calculation and carrying value	1) 同左 1 2) 同左 2 3) 折旧方法
Intangible assets	1) 同上 2) Finite/indefinite 3) If impaired, loss and reversals, why and where they are recognized in income statement	1) 同上 2) 未来 5 年的摊销成本 3) if impaired, 同左 (except 不能 loss reversal)

Investment property (cost model and fair value model)

For investment property, firms are required to disclose which valuation model they use.

If they use fair value model, they must state how they determine fair value. If they use cost model, they must also disclose the fair value of the investment property, along with others that are required for PP&E.

When transferring into or out of investment property,
 If the firm uses the cost model, the property's carrying amount does not change; If the firm uses fair value model,

Transfer from	Transfer to	Financial statement treatment
Owner-occupied	Investment property	Treat as revaluation: recognize gain only if it reverses previously recognized loss
Inventory	Investment property	Recognize gain or loss if fair value is different from carrying amount
Investment property	Owner-occupied or inventory	Fair value of asset at date of transfer will be its cost under new classification(公允价值记为成本)

Module 9 Income Taxes

Tax return terminology (纳税申报表)

Taxable income, Taxes payable, Income tax paid, **Tax loss carry-forward** (a current or past loss that can be used to reduce taxable income, can then result in DTA), **Tax base** (net amount of an asset or liability used for tax reporting purposes)

Financing reporting terminology

Pretax income (Accounting profit), income tax expense, deferred tax liabilities, deferred tax assets, valuation allowance, **carrying value** (net balance sheet value of an asset or liability), permanent difference, and temporary difference. Valuation allowance: 估计备抵, to record DTA that are not expected to reverse. Permanent difference: a difference between taxable income and pretax income that will not reverse in the future.

Temporary difference: a difference between the tax base and the carrying value.

DTL: income tax expense > taxes payable (因为现阶段多记录了收入或者少记录了支出, 所以根据纳税表, 现阶段失少交税, 但是以后还是要交的)

注意: only temporary difference, which means it will reverse in the future,才记录 DTL and DTA. A temporary difference from an investment will result in a DTA only if the temporary difference is expected to reverse in the future, and sufficient taxable profits are expected to exist when the reversal occurs. Taxable temporary differences > DTL Deductible temporary differences > DTA Permanent differences > do not create DTL or DTA DTL are expected to reverse and result in future cash outflows. DTA are expected to provide future tax savings.

DTL occurs when

- 1) Revenues are recognized in the income statement before they are included on the tax return due to temporary differences.
- 2) Expenses are tax deductible before they are recognized in the income statement.

The most common way that DTL are created is **when different depreciation methods are used on the tax return and the income statement.**

DTA is created when taxes payable are greater than income tax expense due to temporary differences. (现阶段多交了税)

DTA occurs when

- 1) Revenues are taxable before they are recognized in the income statement.
- 2) Expenses are recognized in the income statement before they are tax deductible.
- 3) Tax loss carry-forwards (**in the first year of operations, a firm produces taxable income of -\$10,000**) are available to reduce future taxable income.
- 4) Impairments (the write-down are recognized immediately in the income statement, but the deduction on the tax return is not allowed until the asset is sold or disposed of.)
- 5) Restructuring (same reason as impairments)
- 6) Different choices of cash flow method (in US, firms that use LIFO are required to use LIFO for tax purposes)
- 7) Post-employment benefits and compensation, Warranty expenses, tax loss carry-forward (税损承前递减), bad debt

expense and customer advance (客户预付款). They are typical causes of DTA.

Permanent differences occurs when

- 1) Revenue that is not taxable
- 2) Expenses that are not deductible
- 3) Tax credits that result in a direct reduction of taxes
- 4) Tax exempt bonds (effective tax rate 减少)

Permanent differences will cause the effective tax rate (=income tax expense/pretax income) to differ from the statutory tax rate (法定税率).

Tips: in general, 如果现阶段正收入较少, 则形成 asset; 正收入较大, 则形成 liability.

If Assets, then tax base > carrying value > DTA; tax base < carrying value > DTL
If Liabilities, then tax base > carrying value > DTL; tax base < carrying value > DTA

Income tax expense = taxes payable + Δ DTL - Δ DTA

If DTL reverses, then it is liability;

If they are not expected to reverse, then they are equity;

If both the timing and amount of tax payments are uncertain, then they are neither of liabilities nor equities.

Under IFRS, all DTL are non-current assets.

Under GAAP, if more likely that DTA will not be realized, then the DTA must be reduced by a valuation allowance.

The valuation allowance is a contra account that reduces the net balance sheet value of the DTA.

1) Increasing the valuation allowance will decrease the net balance sheet DTA, increasing income tax expense(根据上面的公式) and decreasing net income/earnings.

2) By decreasing the valuation allowance, the firm is signaling greater likelihood that future earnings will offset by the DTA (better future earnings).

Under GAAP, DTA and DTL appear separately on the balance sheet, and they are not typically netted. DTL 的计算不逐年累加。

The following deferred tax information is disclosed:

- 1) DTL, DTA and valuation allowance

- 2) Any unrecognized DTL for undistributed earnings of subsidiaries and joint ventures
- 3) Tax effect of each type of temporary difference
- 4) Components of income tax expense
- 5) Reconciliation of reported income tax expense and the tax expense
- 6) Tax loss carry-forwards and credits

In analyzing trends in tax rate, it is important to only include reconciliation items that are continuous (different rates, tax-exempt income, and non-deductible expenses) in nature rather than those that are sporadic (**large asset sales, tax holiday savings**).

Taxing accounting differences, please refer to SCHWESER notes Book 3 P248

Module 10 Non-Current Liabilities

Two types of payments are involved in bonds:

- 1) Periodic interest payments (影响 CFO) and
- 2) Repayment of principal at maturity (影响 CFF)

The balance sheet liability (book value or carrying value) of a bond is equal to the PV of its remaining future cash flows (coupon payment and face value), discounted at the market rate of interest at issuance.

For bonds issued at par, interest expense is equal to coupon interests; for bonds issued at a premium or discount, they are not equal because interest expense includes amortization of any discount or premium.

How to report issuance cost? (Under US GAAP, coupon payments are CFO) **Interest paid = coupon rate at issue * face value**

Interest expense = market rate at issue * carrying value of bonds

In balance sheet, \$1m bond issued for \$980,000 with issuance costs of \$5,000.

- 1) Under GAAP, the firm would increase assets by \$980,000 (\$975,000 cash and \$5,000 deferred charge) and increase liability by \$980,000.

GAAP, issuance costs are capitalized as assets.

- 2) Under IFRS, the bond's issuance costs reduce the bond liability reported on the balance sheet. Thus, the firm will increase assets and liabilities by \$975,000. ***In other words, debt issuance costs are included in the measurement of the bond liability, increasing the effective interest rate.***
- 3) In cash flow statement, under both IFRS and GAAP, **bond issuance costs are usually netted against the bond proceeds and reported on the cash flow statement as CFF.**

Interest paid = Coupon rate at issue × Issued amount of bonds
Interest expense = Market rate at issue × Carrying (book value) of bonds
Amortization of discount = Interest expense - Interest paid

IFRS and GAAP give firms irrevocable (不可撤销的) option to **report debt at fair value**. Gains and losses that result from change in bonds' market yield are reported in income statement.

Summary of Financial Statement Effects of Issuing a Bond, please refer to Book 3 P263

- 1) When bonds mature, the issuer recognizes no gain or loss. The principal repayment is reported as CFF.
- 2) When bonds are redeemed before maturity, Profit/loss = the book value of the bond liability - redemption price.
 - 2.1) Under GAAP, any remaining unamortized bond issuance costs must be written off and included in the gain or loss calculation. Any gain or loss from redeeming debt is reported in the income statement, as a part of continuing operations, and additional information is disclosed separately.
 - 2.2) Under IFRS, **no write-off is necessary as issuance cost is netted against liability already.**

Affirming covenants (强制性条款, 需要做到的) and negative covenants (限制性条款, 限制做的) 均是针对 borrower. Bond covenants are typically discussed in the financial statement footnotes.

More details are disclosed about its long-term debt in the footnotes (as below) or MD&A (both quantitative and qualitative) :

- 1) The nature of the liabilities
- 2) Maturity dates
- 3) Stated and effective interest rates

- 4) Call provisions and conversion privileges
- 5) Restrictions imposed by creditors
- 6) Assets pledged as security
- 7) The amount of debt maturing in **each of the next five years**

Leasing benefits:

- 1) Less costly financing
- 2) Reduced risk of obsolescence
- 3) Less restrictive provisions
- 4) **Off-balancing-sheet financing** (operating lease)
- 5) Tax reporting advantage

Lessee's Perspective

Leases are classified as either finance lease (capital lease) or operating lease.

- 1) **Finance lease is equal to a purchase of an asset that is financed with debt (借债购买资产)**. The lessee will add equal amount to both assets and liabilities, and **recognize depreciation and interest expense** over the term of lease. The lessor removes the asset and replaces with lease receivable.
- 2) **Operating lease is a rental arrangement(租赁条约)**. No asset or liability is reported and the periodic lease payments are recognized as rental expense in the income statement. **Lessees often prefer operating leases because no liability is reported**. The lessor recognized rental income and continues to report and depreciate the leased asset on its balance sheet.

How to classify a finance lease?

- 1) Under IFRS (same for lessee and lessor)
 - 1.1) Title to the leased asset is transferred to the lessee at the end of the lease
 - 1.2) The lessee can purchase the leased asset at a much lower price than the fair value
 - 1.3) **The lease term covers a major portion of the asset's economic life.**
 - 1.4) The PV of the lease payments is **equal** to the fair value of the leased asset
 - 1.5) The leased asset is very specialized that only the lessee can use the Asset.

- 2) Under GAAP (for lessee, 更加确切, 给数字)
- 2.1) Title to the leased asset is transferred to the lessee at the end of the lease
 - 2.2) A bargain purchase option permits the lessee can purchase the leased asset at a much lower price than the fair value
 - 2.3) The lease period is **75% or more** of the asset's economic life.
 - 2.4) The PV of the lease payments is **90% or more of the fair value** of the leased asset
- 3) Under GAAP (for lessor)
- 3.1) Above are met
 - 3.2) The collectability of lease payments is reasonably certain
 - 3.3) The lessor has almost completed performance

Reporting by the Lessee

- 1) Operating lease: rental expense equal to the lease payment is reported as CFO
- 2) Finance lease: interest expense is equal to the lease liability at the beginning of the period multiplied by the lease interest rate (the lower of the lessee's incremental borrowing rate and the lessor's implicit rate). In the cash flow statement, the lease payment is separated into **interest and principal components**. The principal portion is equal to the lease payment minus the interest portion.

Under GAAP, interest paid is CFO, and principal paid is CFF. Under IFRS, interest paid can be CFO/CFF.

一般来说, lease payment 是好算的, 然后 interest expense 也是好算的, 这样 principal payment 就求出来了, 被 beginning value 一减, 就得到当年剩下的 liability, 至于 asset, 则从第一年开始折旧(线性或者加速折旧)

$$\text{Beginning liability} + \text{interest expense} - \text{lease payment} = \text{Ending liability}$$

Similar to the calculation of book value of the bond:

$$\text{Beginning book value} + \text{interest expense} - \text{coupon} = \text{Ending book value}$$

Financial Statement Impact of Finance and Operating lease

以下三点有一个共同规律, 都是考虑 Interest expense

- 1) Balance Sheet

Debt/asset and debt/equity will be higher with finance leases because of the reported liability.

The principal payment due within next year is reported **current liability, which reduces the lessee's current ratio and working capital.**

EBIT will be higher for companies use finance lease because only the depreciation is treated as expense (有部分费用当作了利息开支 interest portion will be recognized as interest expense), while the operating lease recognizes entire lease payment as operating expense.

2) Income Statement

在 **finance lease 中, interest expense 会由大变小 (liability 逐渐变小)**, 所以总共的 expense 也是先大后小, 即 **net income will be lower for a finance lease in its early year and higher in later years**, compared to an operating lease.

3) Cash flow statement

在 Finance lease 中, interest expense 属 CFO, 剩下的 principal repayment 属于 CFF. 在 operating lease 中, 全部为 CFO; 所以 **for finance lease, CFO is higher and CFF is lower.**

For summary of Financing Statement Impact of Lease Accounting, please refer to Book 3 P272.

In sum, all the ratios are worse when the lease is financed. The only improvements from finance lease are higher EBIT, higher CFO and higher net income (in later years).

Reporting by the Lessor

Financing Lease

1) Under GAAP, finance lease is treated as

1.1) sale-type (出售性融资, PV of the lease payments > Carrying value of the asset)

For manufacturers or dealers, **Interest portion goes to CFO and principle goes to CFI.**

1.2) direct financing (直接融资租赁, PV of the lease payments =

Carrying value of the asset)

The lessor is not manufacturers or dealers, but has purchased the asset from a third party. Interest portion goes to CFO and principle goes to CFI.

2) Under IFRS, similar treatment to a sale-type lease is allowed for finance leases originated by manufacturers or dealers.

Operating Lease

- 1) In income statement, **the income reported from the direct financing (和贷款摊销一样, 利息支出在早年是很高的) is higher than that in the operating lease in the early years.**
- 2) In cash flow statement, 可以把下面的表写出来:

Year	Direct Financing		Operating Lease
	CFO (利息)	CFI	CFO
1	3000	17,000	20,000
2	2000	18,000	20,000
3	1000	19,000	20,000

Disclosures in the footnotes relating to finance and operating leases (**both lessees and lessors**)

- 1) General description of the leasing arrangement
- 2) The timing and amounts to be paid or received **in each of the next 5 years. Lease payments after 5 years can be aggregated.**
- 3) Amount of lease revenue and expense
- 4) Amounts receivable and unearned revenues from lease arrangements
- 5) Restrictions imposed by lease agreements

Analysts can use the disclosure to estimate the off-balance-sheet liabilities of operating leases.

- 1) Defined contribution plan, the firm makes no promise to the employee regarding the future value of the plan assets. **Pension expense is equal to the employer's contribution.**
- 2) Defined benefit plan, the employer assumes the investment risk. Both under IFRS and GAAP,
 If fair value > estimated pension obligation, the plan is overfunded and records a net pension asset;
 If fair value < estimated pension obligation, the plan is underfunded and records a net pension liability;

Under IFRS, re-measurements are not amortized to the income statement over time.

For manufacturing firm, under IFRS and GAAP, pension expense is allocated to inventory and COGS for employees who provide direct labor to production and to salary or administrative expense for other employees. As a result, pension expense does not appear separately on the income statement for manufacturing firms.

Leverage ratios

“Debt” refers to interest-bearing obligations, such as short-term debt, bonds payable. Non-interest-bearing liabilities, such as accounts payable, accrued liabilities, and deferred taxes are not considered debt.

当 DB plan, pension expense:

Under IFRS (SI),

1) Service cost and past service cost

2) Interest

expense Under

GAAP (SIE),

1) Service cost

2) Interest expense

3) Expected return on plan assets

Module 11 Financial Reporting Quality

Firms are motivated to overstate net income to:

- 1) Meet earnings expectations
- 2) Remain in compliance with **lending covenants**
- 3) Receive higher incentive compensation

Firms are motivated to understate net income to:

- 1) Obtain trade relief in the form of quotas or **protective tariffs**
- 2) **Negotiate favorable terms from creditors**
- 3) **Negotiate favorable labor union contracts.**

一些公司也试图将 CFI 变成 CFO.

Low quality earnings are the result of:

- 1) Selecting acceptable accounting principles that misrepresent the economics of a transaction.
- 2) Structuring transactions to achieve a desired outcome.
- 3) Using aggressive or unrealistic estimates and assumptions
- 4) **Exploiting the intent of an accounting principle.**

An example of high-quality earning:

Choosing a depreciation method that depreciates the asset at a higher rate than the economic depreciation (and hence results in

lower earnings) is considered to be a more conservative depreciation policy, and this choice implies higher earning quality.

Fraud triangle

1) Incentive or pressure

- 1.1 由于经济行业不景气对财报盈利稳定性的威胁
- 1.2 过多的第三方压力
- 1.3 管理者的**净资产收到威胁**
- 1.4 为了达成销售盈利指标而来自管理营业人员的压力

2) opportunity 内部控制弱的话

- 2.1 公司行业或运营的本质
- 2.2 非有效监管
- 2.3 复杂不稳定的组织架构
- 2.4 不足的内部控制

3) attitudes or rationalization 指实施舞弊的心态

- 3.1 不合适的道德标准
- 3.2 在编织财报时**过多的非会计人员的参与**
- 3.3 管理层以前犯过错
- 3.4 管理层**对股价持续上涨的痴迷**
- 3.5 **向第三方承诺过高的目标**
- 3.6 **没有及时纠正错误**
- 3.7 **为了避税过分减少收入**
- 3.8 管理层和审计员关系不好

Common accounting warning signs and methods for detecting each:

- 1) Aggressive revenue recognition
- 2) Different growth rates of operating cash flow and earnings
Cash flow earnings index = operating cash flow/net income
- 3) Abnormal sales growth as compared to the economy, industry, or peers
- 4) Abnormal inventory growth as compared to sales growth
- 5) **Boosting revenue with non-operating income and nonrecurring gains. In effect, move these items up the income statement**
- 6) Delaying expense recognition
- 7) **Abnormal use of operating leases by lessees compare with industry peers**
- 8) **Hiding expenses by classifying them as extraordinary or nonrecurring.**
Move expenses down the income statement and boost income from continuing operations.
- 9) LIFO liquidations

LIFO (last-in-first-out) liquidation is when a company sells more inventory than it purchases over a period of time, assuming the company is accounting for inventory using the LIFO method.

When companies purchase inventory at different cost levels, they are required to account for each piece of inventory at that purchase price. As companies reduce overall inventory levels, older inventory costs flow to the income statement. Given the usual inflationary environment (rising prices), these pieces of older inventory will be sold at current prices (but listed at their original cost), giving the company a higher margin of profit per sale, skewing gross profit percentages.

A declining LIFO reserve (the difference between LIFO inventory and what it would be under FIFO, which must be disclosed by firms that use LIFO) **is an indication of LIFO liquidation.** Firms should disclose the effects of LIFO liquidation in the financial statement footnotes.

- 10) Abnormal gross margin and operating margin compared to industry peers
- 11) Extending the useful lives of long-term assets
- 12) Aggressive pension assumptions**
- 13) Year-end surprise
- 14) Equity method investments and off-balance-sheet special purpose entities
- 15) Other off-balance-sheet financing arrangements including debt guarantees.

Operating cash flow is usually unaffected by estimates and judgments. However, firms can still create the perception that sustainable operating cash flow is greater than it actually is.

Four ways to manipulate the cash flow statement

- 1) Stretching accounts payable 延长应付账款
 $\text{Days' sales in accounts payable} = (\text{accounts payable} / \text{COGS}) * \text{number of days}$ 注意这里用的时 COGS,之前用的时 purchase
- 2) financing accounts payable 应付账款融资 (**reduce CFO as payables are reclassified as short term debt**)
Such an arrangement **allows the firm to manage the timing of the reported operating cash flow.**
- 3) Securitizing accounts receivable 应收账款证券化, **会增加 CFO**
The cash received from borrowing against accounts receivables is CFF.

When receivables are securities, they are usually transferred to a bankruptcy remote structure known as SPV. By securitizing its accounts receivable, rather than waiting to collect from the customer, **a firm can accelerate cash flow into the current period.** Securitizing accounts receivable may also affect earnings. The gain or loss is the result of differences between the book value and fair value of the receivables at the time of securitization. GAAP is silent on where the gains should be reported.

4) Issuance of stock options

执行 option 时, the issuing firm gets a tax deduction for that year reflecting the difference between the strike price and the market price of the option that will decrease cash taxes payable in that period; **operating cash flow is greater than it would have been if cash compensation was paid instead;**

5) Repurchasing stock to offset dilution due to the option exercises (most buy backs occur in the open market and do not result in any distortion of cash flows.)

The cash received from the exercise of the option and cash expended by a company for the buyback of corporate stock are both reported as CFF.

Consequently, as option exercises grow, so does the boost to operating cash flows for the tax benefit, but the outflows for stock buybacks to offset dilution of earnings are recorded in the CFF.

执行股票期权的 tax benefits 属于 CFO,但是 buy back 的 cash flow 属于 CFF.

For analytical purpose, the cash outflows for share repurchase should be reclassified from CFF to CFO to better reflect the substance of the transaction.

Module 12 : Applications of Financial Statement Analysis

A forecast of future net income and cash flow often begins with a forecast of

future sales.

A typical assumption is non-cash working capital, as a percentage of sales remain constant.

Credit analysts: Character, Collateral, and Capacity to repay.

Items use by Moody and Fitch:

- 1) Scale and diversification
- 2) Operational efficiency
- 3) Margin stability
- 4) Leverage

Higher P/E ratio > growth company > higher MV relative to BV
Low Price-to-book or high dividend screen will likely include an inordinate proportion of financial services companies.

Several adjustments to improve the comparability of firm's financial statements and ratios:

- 1) Investments in securities
- 2) Inventory accounting differences

The LIFO reserve, which all LIFO firms must report, can be used to **adjust LIFO cost of goods and inventory to their FIFO-equivalent values**. Example: **to adjust assets, add the LIFO reserve to current assets; to adjust COGS, subtract the increase in the LIFO reserve from COGS**

- 3) Differences in depreciation methods and estimates
- 4) Off-balance-sheet financing

Debt ratios should include liabilities for both capital leases and operating lease. The former is easy to get, but it is not easy to estimate the PV of operating lease abilities.

- 5) Goodwill

For the company that has grown through acquisition:

- 5.1) Tangible **assets** will be recorded at **fair value** as the acquisition date.
- 5.2) Identifiable **intangible assets** of the acquired units will be valued at their **acquisition cost**.
- 5.3) Goodwill will be shown on balance sheet.

Two adjustments to goodwill:

- 5.4) Goodwill should be subtracted from assets when calculating

financial ratios.

- 5.5) Any income statement expense from impairment of goodwill in the

current period should be reversed, increasing net income.

- 6) Other tangible assets

Cumulative amount of any such upward revaluations should be reduced from Equity. (Compare IFRS and GAAP firms)

Price to tangible book value (PTBV) removes both goodwill and intangible assets from equity to get tangible book value.

Pre- and post- acquisition financial statement may lack comparability when the acquisition method is used.

The method combines fair value estimates of identifiable assets with historical asset costs on the balance sheet and adds the earnings of the purchased firm with no restatement of prior results.

Corporate Finance

Module 1 Introduction to Corporate Governance and Other ESG Considerations

Corporate governance is the set of internal controls, process, and procedures by which firms are managed.

The duty of the board is to act in the shareholders' long-term interests. A truly independent board will have the ability to hire external consultants without management approval.

投资者应该注意:

- 1) **A majority of the board of directors is comprised of independent members (not management)**
- 2) The board meets regularly outside the presence of management
正确的行为
- 3) **The chairman of the board is also the CEO or a former CEO of the firm.** This may impair the ability and willing ness of independent board members to express opinions contrary to those of management.
- 4) Board members are closely aligned with a firm supplier (不好,不独立)
- 5) Independent board members have a primary or leading board member in case where the chairman is not independent.
- 6) A board member of firm B who is a partner in an accounting firm that competes with the firm's auditor. (错误的行为)

It is not clear whether it is better to have all members elected annually (more flexibility to meet changes in the marketplace) or whether it is better to have staggered board terms (better continuity of board expertise, but make it more difficult for shareholders to change the board of directors).

投资者应该注意:

- 1) 至少每年可以重新选举 board
- 2) 是否有权利罢免 board member
- 3) the board 是否没有通知 investor 就任免某人
- 4) board 的人数是不是差不多正好

To be considered independent, a board member must not have any material business or other relationship with:

- 1) The firm and its subsidiaries, including former employees, executives, and their families.
- 2) Any entity which has a cross directorship with the firm.
- 3) Executive management and their families
- 4) The firm's advisers and auditors

When evaluating the qualifications of board members, consider whether board members:

- 1) Can make informed decisions about the firm's future
- 2) Can act with care and competence as a result of their experience
- 3) Have other board experience
- 4) Regularly attend meetings
- 5) Have significant stock positions?
- 6) Have necessary experience and qualifications
- 7) Have served on the board for more than 10 years. 虽然加经验,但可能和管理层太接近了

Audit committee, investor must determine whether (有无会计背景没有关系):

- 1) The external auditor is free from management influence.
- 2) The audit committee has authority to approve or reject any proposed non-audit engagements with the external audit firm.
- 3) All board members serving on the audit committee are independent.
- 4) The audit committee controls the audit budget

Compensation committee, investor must determine whether:

- 1) The firm has provided loans or the use of company property to board members
- 2) Terms and conditions of options granted are reasonable.

- 3) Senior executives from other firms have cross-directorship links with the firm or committee members. Watch for situation where individuals may benefit from reciprocal decisions on board compensation.

Nominations committee, investor must determine whether:

- 1) Criteria for selecting new board members
- 2) The process for finding new members
- 3) Succession plans for executive management

The ability to vote proxies is a fundamental shareholder right.

Investors should consider whether the firm:

- 1) Limit the ability to vote shares by requiring attendance at the annual meeting
- 2) Groups its meetings to be hold the same day as other companies in the same region and requires attendance to cast votes
- 3) Allows proxy voting by some remote mechanism
- 4) Is allowed to use share blocking (不好的行为, 防止投资者为了更大投票权而在年会前交易股票)

Confidential voting (对 minority group 好)

Cumulative voting is generally viewed as favorable for shareholders. It enhances the likelihood that shareowners' interests are represented on the board. Information on possible cumulative voting rights will be contained in the articles of organization and bylaws, the prospectus, or Form 8-A.

Voting for other corporate change

Watch for changes to: poison pill provisions (为阻挠被兼并而向对方索取极高要价)

Investors should be able to review issues such as:

- 1) Share buy-back programs that may be used to fund share-based compensation grants.
- 2) Amendments or other changes to a firm's charter and bylaws.
- 3) Issuance of new capital stock.

Shareowner-sponsored Board

Nominations

投资者应该关注是否能提名或者罢免 board member (去查看 **proxy statement**)

Shareowner-sponsored resolutions

投资者应该关注能否提出意见

Advisory or Binding shareowner proposals

投资者应该关注是否 board 被要求执行任何股东意见

Different classes of common equity (information can be **found in the proxy**) Firms that separate voting rights from economic rights have historically had more trouble raising equity capital for fixed investment and product development than firms that combine those rights.

Shareowner legal rights

Takeover defenses (竞争阻挠)

1) Golden parachutes (senior management resigns)

2) poison pills (为阻挠被兼并而向对方索取极高要价)

3) Greenmail (高价买回股票)

All above have probable effect --- **decrease share values.**

Module 2 Capital Investments☆☆☆

The typical steps of capital budgeting:

1) Idea generation

2) Analyzing projects proposals

3) Create the firm-wide capital budget

4) Monitoring decisions and conducting a **post-audit**

*Rescheduling and prioritizing projects is part of the step 3, not the post-audit. The post-audit's purpose is to explain any differences between the actual and predicted results of a capital budgeting project. This process can aid in **indicating systematic errors, improve business operations, and provide concrete ideas for future investment opportunities.***

$$PI = 1 + \frac{NPV}{CF}$$

Categories of Capital Budgeting Projects

1) Replacement projects to maintain the business (made without detailed analysis)

2) Replacement projects for cost reduction (a fairly detailed analysis is necessary in this case)

3) Expansion projects (very detailed analysis)

- 4) New product or market development (very detailed analysis)
- 5) Mandatory projects (required by government agency or Insurance Company)
- 6) Other projects

5 key principles in capital budgeting (包括的因素):

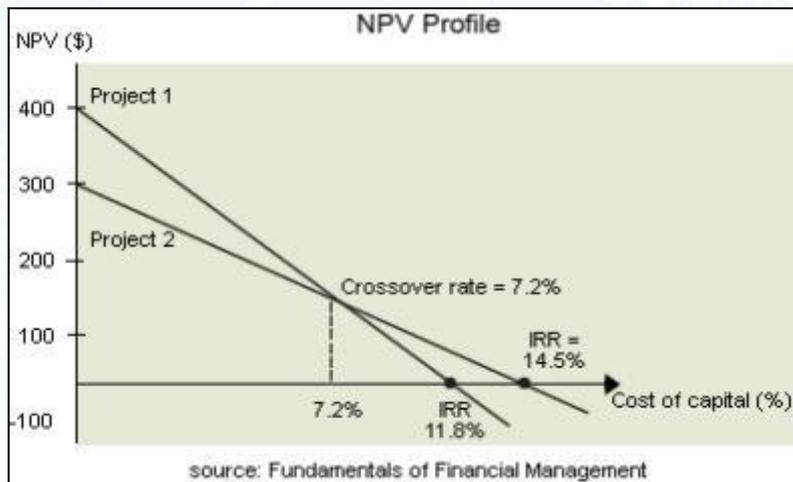
- 1) Decisions are based on incremental cash flows, not accounting income. 要考虑的是 incremental cash flows. **Sunk cost (consulting fee) should not be included in the analysis.** When considering externalities (应该包括), the full implication of the new project should be taken into account. The negative externality is called cannibalization, which occurs when a new project takes sales from an existing product. Conventional cash flow pattern if the sign on the cash flows changes only once; unconventional cash flow pattern has more than one sign change.
- 2) Cash flows are based on **opportunity costs**.
- 3) **The timing of cash flow** is important.
- 4) **Cash flows are analyzed on an after-tax basis**
- 5) **Do not consider financing costs** specific to the project as they are already reflected in the project's required rate of return. (即不包括 interest costs). Payback period is useless as a measure of profitability, but is a good measure of **project liquidity**. Discounted payback period must be greater than the payback period without discounting; it addresses one of the drawbacks by discounting the cash flows but still does not consider any cash flows beyond the payback period, again it is a measure of liquidity.

NPV rule 主要缺点是 不考虑 project 的大小, IRR 的缺点是可能算到不同的 IRR 或者求不到 IRR. 当两者有矛盾时, 根据 NPV. **没有 IRR 的 project 也可能是盈利的.**

NPV 假设 reinvestment rate as the discount rate used to calculate NPV (合理)

IRR 假设 reinvestment rate as IRR (太高了)

NPV profile: the horizontal axis is cost of capital; the point at which a profile crosses the horizontal axis is described as IRR; the point at which a profile crosses the vertical axis is described as the sum of undiscounted cash flows from a project; the crossover rate is best described as the discount rate at which two projects have the same NPV.



当 cost of capital < crossover rate, NPV rule disagrees IRR rule.

A positive NPV project should cause a proportionate increase in a company's stock price.

Module 3 Working Capital & Liquidity

A company's **primary sources** of liquidity are the sources of cash it uses in its normal day-to-day operations, such as cash balance, short-term funds and cash flow management.

Secondary sources of liquidity include liquidating short-term or long-lived assets, negotiating debt agreements, or filing for bankruptcy and reorganizing the company.

以下两者均减弱流动性:

Drags on liquidity (进得慢) delay or reduce cash inflows, or increase borrowing costs, such as bad debt and obsolete inventory.
 Pulls on liquidity (出得快) accelerate cash outflows.

Operating cycle (从原材料到现金收入) = days of inventory + days of receivables

Cash conversion cycle is also called net operating cycle. 这个值**越小越好**,太大的话意味着 excessive amount of investment in working capital.

Accruals are paid at a later date, and depreciation is a noncash expense, so both of them do not affect net daily cash position.

*A company extends its trade credit terms by four days to all its credit customers. The most likely effect of this change to the company's credit customers is a **four-day decrease in the company's net operating cycle.***

Terms of "2/10 net 60" mean that if the invoice is paid within 10 days, the company gets a 2% discount on the invoiced amount and that if the company does not take advantage of the discount, the net amount is due 60 days from the date of the invoice. (如果公司在 10 天内没有得到 2% 的折扣, 那么最好等到第 60 天再付款)

$$\text{receivables} = \frac{\text{credit sales}}{\text{average receivables}}$$

$$\text{BEY} = \text{HPY} * \frac{365}{t}$$

$$\text{MMY} = \text{HPY} * \frac{360}{t}$$

$$\text{Cost of trade credit} = \left(\frac{1}{1-D\%} \right)^{\text{days past discount}} - 1$$

An extension of days' payables may serve as an early warning of deteriorating short-term liquidity.

Sources of short term funding from banks

1) lines of credit (大公司)

1.1 uncommitted line of credit (如果环境变的话银行可以取消)

1.2 committed (regular) line of credit (期限一般短于一年, 美国外称为

overdraft lines of credit)

1.3 revolving line of credit (期限一般较长)

The bank may also have a **Blanket Lien**, which gives it a claim to all current and future firm assets as collateral in case the primary collateral is insufficient and the borrowing firm defaults.

2) Banker's acceptance (银行担保, 跨国国际大公司使用, 出口方从进口方通过 银行得到), 出口方可以出售 BA 来获得立刻的现金流

3) Factoring 保代(小公司)

Smaller companies use collateralized loans, factoring, or loans from non-bank companies as their sources of short-term financing, 利率较高.

Larger companies can take advantage of commercial paper (interest rate lower than bank's), banker's acceptances and lines of credit.

It is often worth having slightly higher overall short-term funding costs in order to have flexibility and redundant sources of financing.

如果题目没有给 purchase 的话,可以自己求:

$$\text{Purchase} = \text{COGS} + \text{Ending Inventory} - \text{Beginning inventory}$$

Module 4 Cost of Capital-Foundational Topics☆☆☆

WACC is also referred to as the marginal cost of capital (For a given company, debt is generally less costly than preferred or common stock).

注意,有时候题目中问 the cost of retained earnings, 就是指 cost of equity

$$\text{WACC} = w_d k_d (1 - t) + w_{ps} k_{ps} + w_{ce} k_{ce}$$

The cost of preferred stock is: $K_{ps} = D_{ps} / P$

(D_{ps} = the preferred stock dividend per share

P = the current preferred stock price per share)

3 种方法来求 K_{ce} (cost of equity is equal to the rate of return required by stockholders)

1) CAPM model

$K_{ce} = R_f + F (R_m - R_f)$ (这里的 risk free rate 有时候是 Rate of return on 10-year Treasury bonds)

F 的求法:

Pure-play method: to estimate project beta, begin with the beta of a company or group of companies that are purely engaged in a business similar to that of the project and are therefore comparable to the project.

步骤(请注意,asset beta does not change with a higher D/E ratio, only equity beta does)

1.1) 先估算 β_{equity} (缺陷: 对使用数据的频率以及广度敏感,取决于哪个

index,估计小市值的时候可能需要往上调整来反应没有被捕捉到的风险);

1.2) 然后除以 $1+(1-t)D/E$ (这里的数据都是作比较公司的) 得到 β_{asset} ;

1.3) 最后乘以 $1+(1-t)D/E$ (这里的数据都是作要求的公司的) 得到

$\beta_{project}$;

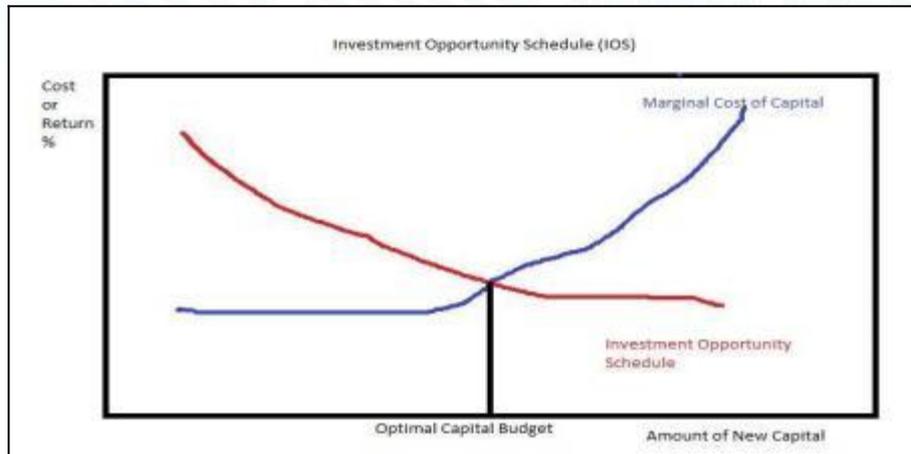
2) $K_{ce} = D_1 / P_0 + g$ ($g = \text{ROE} * \text{Retention rate}$)

3) $K_{ce} = \text{long-term bond yield} + \text{risk premium}$

Based on priority, we should use:

- 1) Target capital structure
- 2) Current capital structure
- 3) Industry average structure

WACC is an upward line, Investment opportunity schedule (by order) is a downward line, the intersect point is the optimal capital budget. The intuition here is that the firm should undertake all those projects with IRRs greater than the cost of funds.



WACC 只是对现有项目的一个风险描述,新的项目(如果风险与WACC 不一致的话) 不能用 WACC 来描述.

Cost of debt is the market interest rate (YTM) on new (marginal) debt, not the coupon rate on the firm's existing debt.

Matrix pricing: if YTM is not available, the analyst may use the rating and maturity of the firm's existing debt to estimate the before-tax cost of debt. If there is a covenant or seniority, we should make adjustment; if firms employ floating-rate debt, we should estimate the long-term cost of the firm's debt using the current yield curve for debt of the appropriate rating category.

对以上 CAPM 估计的调整: $K_{ce} = R_f + F [(R_m - R_f) + \text{country risk premium}]$

CRP

= soveTeign yield spTead

*

annualized stdev of equity index of developing country

annualized stdev of sovereign bond market in terms of the developed market currency

As a firm raises more and more capital, the costs of different sources of financing will increase, which means it may be upward sloping with respect to additional capital. The bottom line is raising additional capital results in an increase in the WACC. (横轴是 capital raised,纵轴是 WACC)

Break points occur any time the cost of one of the components of the company's WACC changes.

Flotation costs 发行成本

The correct way to account for flotation costs is to adjust the initial project cost. 注意发行成本只是针对于股票发行. Flotation cost 不影响 WACC 的计算, 唯一的影响是在最开始的 cash outflow 增加了, 既而影响 NPV. 如果 flotation cost 还是 tax-deductible 的话, cash outflow 会减少 (用税后的数值)

Module 5 Measure of leverage

Business risk is a combination of sales risk and operating risk.

Financial risk refers to the additional risk that the firm's common stockholders must bear when a firm uses fixed cost (*debt, or long-term leases/debentures*) financing.

DOL (measure operational risk)

$$= \frac{\text{Sales} - \text{total variable costs } S - TVC}{\text{sales} - \text{total variable costs} - \text{fixed costs } S - TVC - F} = \frac{Q(P - V)}{Q(P - V) - F} = \frac{\Delta EBIT}{\Delta \text{sales}}$$

Please note the DOL depends on the level of sales. Sales 增加, 则情况好转, leverage 下降.

DFL (measure financial risk)

$$= \frac{EBIT}{EBIT - \text{interest}} = \frac{S - TVC - F}{S - TVC - F - I} = \frac{Q(P - V) - F}{Q(P - V) - F - I} = \frac{\Delta EPS}{\Delta EBIT}$$

No fixed costs, no operating leverage; no interest costs, no financial leverage.

$$DTL = DOL * \frac{\Delta EPS}{\Delta SALES} = \frac{S - TVC}{S - TVC - F - I}$$

DFL =

The use of financial leverage increases the risk of default but also increases the potential return for equity holders.

When it comes to "breakeven", only consider "fixed".

Breakeven quantity of sales =

$$\frac{\text{fixed operating costs} + \text{fixed financing costs}}{\text{price} - \text{variable cost per unit}}$$
 Operating breakeven

quantity of sales =
$$\frac{\text{fixed operating costs}}{\text{price} - \text{variable cost per unit}}$$

Equity Investments

Module 1 Market organization and structure☆☆☆

The main function of the financial system:

- 1) Allow entities to save and borrow money, raise equity capital; manage risks.
- 2) Determine the returns
- 3) Allocate capital

开放式基金,投资者卖还给基金; 封闭式基金,投资者只能在二级市场卖给其他投资者. The shares of a closed-end fund trade at a premium or discount to NAV.

Money markets refer to markets for debt securities with **maturities of one year or less.**

Capital markets refer to markets for **longer-term debt securities and equity securities that have no specific maturity date.**

- 1) Traditional investment markets refer to those for debt and equity.
- 2) Alternative markets refer to those for **hedge funds, commodities, real estate, collectibles, gemstones, leases, and equipment.** Alternative assets are often more difficult to value, illiquid, require investor due diligence, and therefore often sell at a discount.

Debt securities are promises to repay borrowed funds.

Equity securities represent ownership positions.

Private securities are often illiquid and not subject to regulation.

Bonds are generally long term; notes are intermediate term.
Commercial paper refers to short-term debt issued by the firm.
Government Issue bills and banks issue CDs.

Equity securities:

- 1) Common stock: common stock dividends are paid only after interest is paid to debt holders and dividends are paid to preferred stockholders.
- 2) Preferred stock is an equity security with scheduled dividends that typically do not change over the security's life.
- 3) Warrants.

Pooled investment vehicles

- 1) Mutual funds
- 2) ETF, these funds are sometimes referred to as depositories, with their shares referred to as **depository receipts**.
- 3) Asset-backed securities
- 4) Hedge funds are organized as limited partnership, with the **investors as the limited partners (有限合伙人) and the fund manager as the general partner (普通合伙人)**.

Currencies

Reserve currency: USD, EURO, GBP, JPY and CHF.

Real assets:

An investor may choose to invest through REIT (real estate investment trust) or MLP (master limited partnership), or they can buy the stock of firms that have large ownership of real assets.

Real assets are characterized by illiquidity. The heterogeneity (异质性) of real assets, their illiquidity, and the substantial costs of managing them are all factors that complicate the valuation of real assets.

Market maker:

- 1) Act as a broker to match buy/sell orders (stop buy/sell)
- 2) act as a dealer to provide liquidity

Broker 经纪人同时找到买家卖家,减少交易成本.

Block brokers help with the placement of large trades, and they help conceal their clients' intentions so that the market does not move against them. Exchange provides a venue where traders can meet.

Alternative trading systems/electronic communication networks/multilateral trading facilities
ATFs that do not reveal current client orders are known as dark pool.

Dealers provide liquidity in the market and profit from the bid/ask spread. Some dealers also act as brokers. **As brokers, they should seek the best prices for clients, but as dealers, their goal is to profit through spreads.**

Securitizations

The primary benefit of securitization is to decrease funding costs for the assets in the pool.

Depository institutions

The equity owners of banks and brokers absorb any loan losses before depositors and other lenders. The more equity capital an intermediary has, the less risk for depositors.

Insurance company provides a benefit to investors by managing the risks inherent in insurance: **moral hazard, adverse selection, and fraud.**

Arbitrageurs

More commonly, arbitrageurs try to exploit pricing differences for similar instruments.

Clearinghouses and custodians

Clearinghouses limit counterparty risk. Custodians improve market integrity by holding client securities and preventing their loss due to fraud.

As a rule of thumb, hedgers must “do in the futures market what they must do in the future”.

The repayment of the borrowed security or other asset is referred to as “covering the short position”.

The short seller must **pay all dividends or interests that the lender would have received from the security that has been loaned to the short seller.** These payments are called **payments-in-lieu of dividend or interest.**

$$\text{Margin call price} = P_0 \left(\frac{1 - \text{initial margin}}{1 - \text{maintenance margin}} \right)$$

In terms of bid/ask price, just remember the price you get will be the one that is worse for you.

Execution instructions

- 1) Market order
- 2) Limit buy/sell
 - 2.1) A limit buy order above the best ask or a limit sell order below the best bid are said to be marketable or aggressively priced;
 - 2.2) If the limit price is between the best bid and the best ask, a limit order is said to be making a new market;
 - 2.3) A buy order with a limit price below the best bid is said to be **behind the market**.
 - 2.4) If a limit-buy order at the best bid, it is said to make the market.
 - 2.5) If a limit-sell order at the best bid, it is said to take the market.
- 3) All-or-nothing orders execute only if the whole order can be filled.
- 4) Hidden orders are those for which only the broker or exchange knows the trade size.
- 5) Iceberg orders, similar to hidden order but traders can also specify display size.

Validity instructions

- 1) Day orders
- 2) Good-till-cancelled orders last until they are filled.
- 3) Immediate-or-cancel (fill-or-kill) orders are cancelled unless they can be filled immediately.
- 4) Good-on-close orders are only filled at the end of the trading day. If they are market orders, they are referred to as market-on-close orders. (Used by mutual funds as their portfolios are valued using closing prices)
- 5) Stop loss order

Stop buy always buy at a price higher than market price, either cover short or wait for confirmation.

Stop-sell orders execute when market prices are falling, while stop-buy orders execute when the market is rising.

Clearing instructions

One important clearing instruction is whether a sell order is a short sale or long sale.

1) Primary capital markets

1.1) seasoned offerings or secondary issues 增发

1.2) IPO

2) Secondary financial market

Secondary markets are important because they provide liquidity and price/value information.

Gathering indications of interest in bond issue is referred to as the book runner. Underwritten offering: the IB agrees to purchase the entire issue at a price that is negotiated between the issuer and bank. If the issue is undersubscribed, the IB must buy the unsold portion.

Best efforts basis: If the issue is undersubscribed, the IB is not obliged to buy the unsold portion.

1) In a *private placement*, securities are sold directly to qualified investors.

2) *Shelf registration:* a firm makes its public disclosures as in a regular offering but then issues over time when it needs capital and when the markets are favorable.

3) *Dividend reinvestment plan* allows existing shareholders to use their dividends to buy new shares at a slight discount

4) *Rights offering:* existing shareholders are given the right to buy new shares at a discount.

Call market: one single negotiated price is set that clears the market for the stock. It is used in smaller markets but is also used to set opening prices and prices after trading halts on major exchanges.

Continuous markets: stock can trade any time the market is open.

Market structure

1) *Quote-driven market*/dealer markets/price-driven market/OTC market **Most securities other than stocks trade in quote-driven markets.** Trading often takes place electronically.

2) *Order-driven market*

Exchanged and automated trading systems are examples of order-driven markets. Two sets of rules in these markets (按顺序):

1.1 Firstly, order matching rules

先考虑最高价买家和最低价卖家,如果一样,则会考虑 give priority to non-hidden orders and earliest arriving orders.

1.2 Secondly, trade pricing rules

Under the uniform pricing rule, 价格定在最大成交量; under the discriminatory pricing rule uses the limit price of the order that arrived first as the trade price.

3) *Brokered markets*

Large block of stocks

Market information

Pre-trade transparent: investors can obtain pre-trade information regarding quotes and orders;

Post-trade transparent: investors can obtain post-trade information regarding completed trade prices and sizes.

Buy-side traders value transparency; dealers prefer opaque market because transaction costs and bid-ask spread are larger in opaque markets.

A well-functioning financial market fulfill the following:

- 1) Investors can save for the future at fair rates of return
- 2) Creditworthy borrowers can obtain funds
- 3) Hedgers can manage their risks
- 4) Traders can obtain the assets they need.

If markets can perform these functions at low trading costs, it is said to be **operationally efficient**;

If security prices reflect all the information associated with fundamental value in a timely fashion, it is said to be **informationally efficient**.

Short sale 100 shares @42 (good-till-cancelled, stop 50, limit 55 buy), and then the maximum loss is 1300.

Module 2 Security Market Indexes☆☆☆

Price index > price return

Return index > total return (also includes dividends or interest payments)

1) price-weighted index (DJIA 和 Nikkei 225)

The return is just calculated from **the change in average price**

缺点是**高价股**比低价股比重更大；特点是 number of shares are same for each underlying; 股票如果分红或者 split 或者 repurchase 的话需要 adjust Please see example below:

Index before the split	$= \frac{10 + 20 + 60}{3} = 30$
New divisor, X: 30	$= \frac{10 + 20 + 20}{x}$
	$x = 1.67$
Index after the split	$= \frac{12 + 19 + 22}{1.67} = 31.7$

- 2) equal-weighted index (value line composite average 和 Financial Times Ordinary Share Index), which is the **main situation when it needs rebalancing**

特点是各标的 dollar amount 一样. 股票价格变的话需要 rebalance. **小盘股** 股票数目更多, 所以对指数影响比大盘股大.

The return of the equal-weighted index over a given period is often calculated as a simple average of the returns of the index stocks.

- 3) Market capitalization-weighted index (S&P 500) 股票 split 或者分红的时候不需要 adjust

指数变化根据总市值变化, return 就是前后 market cap 的变化

- 4) Float-adjusted market capitalization index 类似于第三个, 但是只考虑 total values of the shares that are actually available to the investing public.

第三第四主要的缺点在于 **the relative impact of a stock's return on the index increases as its price rises and decreases as its price falls. 偏向价格上升的股票**

Most security market indexes are market capitalization-weighted and often adjusted for the float (securities actually available for purchase).

- 5) **Fundamental weighting**, these weights are unaffected by the share prices of the index stocks. A fundamental-weighted index will actually have a **value tilt, overweighting firms with high value-based metrics such as book-to-market ratios or earnings yields**. Portfolio weights will shift away from securities that have increased in relative value.

“Contrarian effect”: **偏向价格下跌 (value-based matrix 上涨) 的股票**

When a security is added to an index, its price tends to rise as portfolio managers seeking to track that index in a portfolio buy the security.

Security market indexes have several uses:

- 1) Reflection of market sentiment
- 2) Benchmark of manager performance
- 3) Measure of market return and risk (注意是 proxy)
- 4) Measure of beta and risk-adjusted return
- 5) Model portfolio for index funds

Equity indexes can be classified as follows:

- 1) Broad market index
- 2) Multi-market index (MSCI World Index)
- 3) Multi-market index with fundamental weighting
- 4) Sector index (provides a means to determine whether an active investment manager is more successful at stock selection or sector allocation, serving as the benchmark)
- 5) Style index (according to **market capitalization, value, growth**), typically have high turnover of constituent firms than broad market indexes

Market float represents shares available to the investing publics and excluded shares held by controlling shareholders;
Free float is a narrower measure that also excluded shares that are not available to foreign investors.

Fixed income indices

- 1) Large universe of securities. Unlike equities, bonds mature and must be replaced in fixed income indexes. As a result, turnover is high in fixed income indexes.
- 2) Dealer market and infrequent trading. *Dealers primarily trade fixed income securities, so index providers must depend on dealers for recent prices, or they must estimate the prices of constituent securities using the prices of traded fixed-income securities with similar characteristics.*

Illiquidity, transaction costs, and high turnover of constituent securities make it both difficult and expensive for fixed income portfolio managers to replicate a fixed income index.

Three of the most widely held alternative assets are **commodities, real estate, and hedge funds.**

The issues in commodity indexes are:

- 1) Weighting method.
- 2) Futures vs. actual. Commodity indexes are based on the prices of **commodity futures contracts**, not the spot prices of commodities. Commodity futures contracts reflect the **risk free rate, changes in futures prices, and the roll yield.**

Real estate indexes (**appraisal index, repeat sales index**)

While real properties are quite illiquid, REIT shares trade like common shares and offer very good liquidity.

Most hedge fund indexes equally weight the returns of the hedge funds included in the index. **A unique feature of hedge fund indices** is it is constituents of the index they determine them, rather than index providers determining the constituents.

Module 3 Market Efficiency

An informationally efficient capital market is one in which the current price of a security fully, quickly, and rationally reflects all available information about that security.

In a perfectly efficient market, investors should use a passive investment strategy because active investment strategies will underperform due to transaction costs and management fees.

The market value of an asset is its current price. The intrinsic value or fundamental value of an asset is the value that a rational investor with full knowledge about the asset's characteristics would willingly pay. 每个投资者的 内在价值估计都不同,而且内在价值估计会随着新消息的公布而不断变化.

Factors that affect a market's efficiency

- 1) Number of market participants
- 2) Availability of information
- 3) Impediments to trading
- 4) Transaction and information costs

Technical analysis expects stock price to move in trends that persist for long periods of time;
Fundamental analysis expect the price adjustments to be more abrupt.

EMH (the stronger, the harder)

1) Weak form > reflect past data information > can't profit from technical analysis

In the weak-form efficient market hypothesis, security prices fully reflect all past market data including transactions by exchange specialists.

Which of the following market anomalies is inconsistent with weak-form market efficiency? 即选择能够通过技术分析获利的选项

2) semi-strong form > reflect public information > can't profit from fundamental analysis (话说回来,正是由于基本分析才导致市场信息有效)

Fundamental analysis facilitates a semi-strong efficient market by disseminating value-relevant information. Fundamental analysis can be profitable in terms of generating abnormal returns if the analyst creates a comparative advantage with respect to this information. Such an advantage can be achieved by doing a superior job of estimating the relevant variables and predicting earnings surprises.

3) Strong form > reflect both public and private information > can't make any profit

Abnormal profit calculations are often used to test market efficiency. An event study is one method of testing the semi-strong form. The evidence in DM indicates that markets are generally semi-strong form efficient. However, there is evidence of semi-strong form inefficiency in some EM countries. Even if markets are semi-strong, portfolio managers can add value by establishing and implementing portfolio risk and return objectives and by assisting clients with portfolio diversification, asset allocation, and tax management.

韦恩图上最外圈是 weak form, 中圈是 semi-strong form, 内圈是 strong form.

Investigating data until a statistically significant relation is found is referred to as **data mining** or data snooping. To avoid it,

- 1) Check if an economic basis exists
- 2) Run with out-of-sample data

3) Run in various sub-periods

1) Anomalies in Time-Series Data

1.1) calendar anomalies, 一月效应,原因可能有二,一是 tax-loss selling, 而是 window dressing;

1.2) Overreaction and momentum anomalies

They **violate the weak form** because they provide evidence of a profitable strategy based only on market data.

2) Anomalies in Cross-Sectional data

2.1) Size effect

2.2) Value effect. Value stocks (**those with lower PE, lower market-to-book, and higher dividend yields**) have outperformed growth stocks. This violates the semi-strong form.

3) Other Anomalies

3.1) Closed-end investment funds 交易价格为 NAV 的折扣,主要因为 transaction costs.

3.2) Earnings announcements The anomaly is that the adjustment process does not occur entirely on the announcement day.

3.3) IPO 长期表现经常低于平均

3.4) Economic fundamentals

总结: the majority of the evidence suggests that reported anomalies are not violations of market efficiency but are due to the methodologies used in the tests of market efficiency.

The bottom line is investment management based solely on anomalies has no sound economic basis.

Behavioral finance:

1) Loss aversion: investors dislike losses more than they like gains of an equal amount. (不对称,可以解释 overreaction)

2) Investor overconfidence

3) Representativeness

Investors assume good companies or good markets are good investments. An investor assessing probabilities of outcomes depending on how similar they are to the current state is called representativeness.

4) Gambler's fallacy (赌徒谬误, 之前输了好多, 之后应该赢了)

Recent results affect investor estimates of future probabilities.

5) Mental accounting

Investors classify different investments into separate mental accounts instead of viewing them as a total portfolio.

- 6) **Conservatism** (slow adjustments of security prices to new information, information cascades (herding behavior, consistent with investor rationality and improve market efficiency)), somewhat similar to investor herding behavior, a term to describe trading that occurs in clusters and is not necessarily driven by information)

- 7) Disposition effect

Investors are willing to realize gains but unwilling to realize losses.

- 8) Narrow framing

Investors view events in isolation.

- 9) *Confirmation bias*

Looking for information that supports prior opinions and decisions, which leads to a tendency to misvalue the stocks of popular companies.

- 10) *Escalation bias*

Investors tend to invest more in money-losing investments for which they feel responsible than they invest in an ongoing successful investment.

- 11) *Prospect theory*

人在不确定条件下的决策选择，取决于结果与展望(预期、设想)的差距而非单单结果本身。即，人在决策时会在心里预设一个参考标准，然后衡量每个决定的结果，与这个参考标准的差别是多大。例如，一个人展望(预期)能得到奖金 500 元，当他的决策让他得到奖金 500 元，他会觉得没什么；若他有办法得到多于预期的 500 元，多数人会审慎地考量这方法(决策)带来的风险，以免失去展望(预期)回报；如果相反，即使他有另一个比较安全，但让他少得 100 元奖金的办法(决策)，那多数人宁可冒较大风险，以获取展望(预期)回报。

The efficient market hypothesis only requires that **the market is rational** (not the investor)

Module 4 Overview of Equity Securities

Common shares:

- 1) Firms are under **no obligation to pay dividends** on common equity.
- 2) Shareholders can **vote by proxy**.

A shareholder has 100 shares, and three directors will be elected. Under statutory voting, the shareholder can vote **100 shares** for his director choice in each election; Under cumulative voting, he has **300 votes**, which can be cast for a single candidate or spread across multiple candidates. To conclude, cumulative voting makes it possible for a minority shareholder to have more proportional representation on the board.

Callable common shares

Give the firm the right to repurchase the stock at a pre-specified call price. Allow the firm to reduce its dividend payments without changing its per-share dividend.

Puttable common shares

Give the shareholder the right to sell the shares back to the firm at a specific price.

Preferred stock

Preferred shares typically make **fixed periodic payments** to investors and **do not usually have voting rights**.

Preferred stock is less risky than common stock because preferred stock pays a known, fixed dividend to investors that are a large part of the return.

1) Cumulative preference shares

Promised fixed dividends, and any dividends that are not paid must be made up before common shareholders can receive dividends.

2) Non-cumulative preference shares do not accumulate over time when they are not paid, but dividends for any period must be paid before common shareholders can receive dividends.

3) Participating preference shares

3.1) Receive extra dividends if firm profits exceed some certain level.

3.2) May receive a value greater than the par value of the preferred stock if the firm is liquidated.

3.3) Participating preference shares do NOT entitle the shareholders to

participate in corporate decisions through voting rights.

- 4) Non-participating preference shares have a claim equal to par value in the event of liquidation and do not share in firm profits.
- 5) Convertible preference shares can be exchanged for common stock at a conversion ratio determined when the shares are originally issued. It has the following advantages (often used to finance risky venture capital and private equity firms):
 - 5.1) The preferred dividend is higher than a common dividend
 - 5.2) Convertible
 - 5.3) The dividend is stable and they have priority over common stock in receiving dividends and in the event of liquidation of the firm.
 - 5.4) Less price volatility than the underlying common shares

Information on the ownership and voting rights of different classes of equity shares can be found in the company's filings with SEC.

Private equity (私募股权投资) is usually issued to institutional investors via private placements.

Private equity has the following characteristics:

- 1) Less liquidity
- 2) Share price is negotiated between the firm and its investors
- 3) More limited firm financial disclosure
- 4) Lower reporting costs
- 5) Potentially weaker corporate governance
- 6) Focus on long-term prospects
- 7) Potential greater return for investors once the firm goes public

Three main types of private investments are venture capital, leveraged buyouts, and private investments in public equity.

- 1) Venture capital financing at various stages of a firm's development is referred to as seed or start-up, early stage, or mezzanine financing (夹层 融资).
- 2) Leveraged buyout: if the buyers are the firm's current management, the LBO is referred to as a MBO.
- 3) Private investment in public equity (PIPE, 上市后私募投资), a public firm that needs capital quickly sells private equity to investors. The investors can often buy the stock at a sizeable discount to its market price.

Direct financing in the securities of foreign companies refers to buying a foreign firm's securities in foreign markets. Other methods are:

- 1) GDRs and ADRs, both are denominated in USD, but GDRs trade outside of US while ADRs trade in the US. GDRs are not subject to the capital flow restrictions.
- 2) GRSs traded in different currencies around the world (global registered).

exchanges in the local currency.

- 3) BLDRs (basket of listed depository receipts) are an ETF that is a collection of DRs.

DRs (depository receipts, 存托凭证) represent ownership in a foreign firm and are traded in the foreign markets in local currencies. Values of DRs are affected by exchange rate change, firm fundamentals, economic events and so on.

- 1) Sponsored DR: the firm is involved with the issue, provides the investors the voting rights and is usually subject to greater disclosure requirements.
- 2) Un-sponsored DR: the firm is not involved with the issue. **The depository bank retains the voting rights.**

Dividends on callable shares > non-callable shares > put-able shares

The primary goal of firm management is to increase the **book value** (retained earnings) of the firm's equity and thereby increase the market value of its equity, which reflects the expectations of investors about the firm's future performance.

ROE = (net income - preferred dividends) / average book value of common equity

A firm can issue debt to repurchase equity, thereby decreasing the book value of equity and increase ROE.

Cost of equity: (very difficult to estimate, use CAPM model) can be interpreted as the minimum rate of return required by investors to compensate them for the risk of firm's equity shares.

Module 5 Introduction to Industry and Company Analysis ☆☆☆

Industry rotation

In an active management strategy, investors engage in overweight or underweight industries based on the current phase of the business cycle.

Portfolio performance attribution, which addresses the sources of a portfolio's returns, usually in relation to the portfolio's benchmark, includes industry or sector selection. Industry classification schemes play a role in such performance attribution.

Firm Classification

1) A sector is a group of similar industries. Systems that are grouped by **products and services** use a firm's principal business activity (the largest source of sales or earnings) to classify firms.

2) Firm can also be classified by their sensitivity to business cycles: cyclical and non-cyclical firms.

Cyclical firms have high earnings volatility and high operating leverage. 比如原 材料,奢侈品,能源,金融行业,工业耐用品.

Non-cyclical firms include health care, utilities, telecommunications, and consumer staples. 继续细分为 defensive industries 和 growth industries. Defensive industries may not always be safe investments.

3) Statistical method, groups firms that have had highly correlated returns. The groups formed will have lower returns correlations between groups.

Industry classification systems

Commercial classifications:

GICS (S&P and MSCI), Russell Global Sectors and Industry Classification Benchmark (Dow Jones/FTSE)

The broadest category is generally the sector level, then industry and sub-industry level.

- 1) Consumer discretionary firms: automotive, apparel (服装), hotels and restaurants
- 2) Consumer staples firms: food, beverage, tobacco and personal care products.
- 3) Technology firms: software, consulting and services.

Government classifications

The main systems are:

- 1) International standard industrial classification of all economic activities (ISIC)
- 2) Statistical classification of economic activities
- 3) Australian and New Zealand industrial classification
- 4) North American industry classification system (NAICS, updated every 5 years)

Most governments do not identify individual firms in a group, so we cannot know the groups' exact composition.

Commercial providers identify the constituent firms.

Governments **do not distinguish** between small and large firms, for-profit and not-for-profit organizations, or private and public firms. Commercial providers only include **for-profit and public** firms.

A peer group is a set of similar companies an analyst will use for valuation comparisons.

Companies in the same peer group

- 1) Derive the revenue and earnings from similar business activities
- 2) Can **have different valuations** depending on structure and competitiveness.

Steps to form a peer group:

- 1) Use commercial classification
- 2) Examine firms' annual reports to see if they identify key competitors
- 3) Examine competitors' annual reports to see if other competitors are named
- 4) Use industry trade publications to identify competitors
- 5) Confirm that comparable firms have similar sources of sales and earnings
- 6) *Adjust financial statements of non-financial companies for any financing subsidiary data they include*

Strategic analysis (波特五力分析)

- 1) Rivalry among existing competitors
- 2) Threat of new entrants
- 3) Threat of substitute products
- 4) Bargaining power of buyers
- 5) Bargaining power of suppliers

1) Barriers to entry: If the same firms dominate the industry today as 10 years ago, entry is probably difficult. **如果容易进, firms**

have little pricing power; 如果容易出, firms have greater pricing power.

2) Industry concentration

3) Industry Capacity: **higher unused capacity results in less pricing power.**

4) Market share stability: more stable markets indicate greater pricing power. High barriers to entry do not necessarily mean that firm pricing power is high. High industry concentration does not guarantee pricing power. Pricing power is guaranteed by **higher relative market share and product differentiation.**

5 phases of the industry life cycle

1) Embryonic stage: **slow growth, higher prices, large investment required, high risk of failure.**

2) Growth stage: **rapid growth, limited competitive pressure, falling price and increasing profitability**

3) Shakeout stage: growth has slowed, intense competition, increasing industry overcapacity, **declining profitability, increased cost cutting, increased failures**

4) Mature stage: **Slow growth, high barriers to entry, stable pricing, consolidation, superior firms gain market shares**

5) Decline stage: **Negative growth, declining prices, consolidation**

Test: An industry with high barriers to entry and weak pricing power most likely has high barriers to exit.

A list of factors to be considered in industry analysis

1) Major firms

2) Barriers to entry and success

3) Industry concentration

4) Influence of industry capacity on pricing

5) Industry stability

6) Life cycle

7) Competition

8) Demographic influences (age distribution and population size)

9) Government influence (taxes and regulation)

10) Social influence (how people work, play, spend their money, and conduct their lives)

11) Technological influence

12) Business cycle sensitivity

External factors on industry growth

1) Macroeconomic factors: education level

2) Technology

- 3) Demographic: age distribution, population size
- 4) Government: tax regulation
- 5) Social influence

Company competitive strategy:

- 1) Low-cost strategy (be able to finance the investment at a low cost of capital. Such as predatory pricing, the firm hopes to drive out competitors and later increase prices.
- 2) Product/service differentiation strategy
 Successful differentiators will have outstanding marketing research teams and creative personnel

Which of the following has the lowest barriers to entry? A

- A. Oil services B. confections and candy C. branded pharmaceuticals

Module 6 Equity Valuation☆☆☆

An analyst will use more than one model with several different sets of inputs to determine a range of possible stock values.

- 1) Discounted cash flow models

- 1.1) Dividend discount models (DDM)

Gordon growth model valuation (most suitable for valuing stable and mature,

non-cyclical, dividend-paying firms):
$$V_0 = \frac{D_1}{K_e - g_c}$$

$$g_c = (1 - \text{div payout ratio}) * \text{ROE}$$

Multistage Dividend Growth model: *如果div从第n年持续增长,那么计算中一共有n-2项,其中前n-3项和div有关,最后一项是第n-2年底的 pricevalue,分子是n-1年底的dividend (不要忘记折现,折现率为ke)*

1.2) Free cash flow to equity models (FCFE, in any case where future dividends cannot be estimated with much confidence, valuation based on FCFE is appropriate as long as growth rates of earnings can be estimated) $\text{FCFE} = \text{CFO} - \text{Fixed Capital investment} + \text{net borrowing}$

- 2) Multiplier models

2.1) The ratio of stock price to fundamentals (P/E, use forward earnings to calculate forward PE ratio)

Price multiples used for valuation include:

2.1.1) PE ratio

2.1.2) Price-sales ratio

2.1.3) Price-book value ratio (appropriate for firms that hold primarily liquid assets, such as banks)

2.1.4) Price-cash flow ratio, where cash flow may be CFO or free cash flow Multiples based on comparable are grounded in the **law of one price** and take into account **historical multiple values**.

相反,P/E multiples based on fundamentals can be based on the Gordon growth model, which takes into account **future expected dividends**.

2.2) The ratio of enterprise value to EBITDA or revenue. (EBITDA 相比于 revenue 的优势就是它总为正值, 劣势是它包括 non-cash revenues and expenses ; **operating income** may be used instead of EBITDA) EV can be viewed as what it would cost to acquire the firm:

EV=market value of common and preferred stock + market value of debt - cash and short-term investments (不能用 book value 来代替)

3) Asset based model

$$\text{Equity value} = \frac{\text{the MV of assets} - \text{the MV of liabilities}}{\text{shares}}$$

三种方法的比较

	Advantage	Disadvantage
Discounted CF	Widely accepted	1) Inputs are estimated 2) Value estimates are sensitive to input values
Multiples based on Comparable	1) Used in time series and cross-sectional comparisons S) EV/EBITDA are independent of capital structure or when earnings are negative	1) Lagging price multiples reflect the past 2) Not comparable when firms have different size or products 3) Different accounting methods
Multiples based on fundamentals	1) They are based on theoretically sound valuation models 2) They correspond to widely accepted value metrics	Very sensitive to the inputs (especially the k-g denominator)

<p>Asset- based models (处于高通胀环境的公司不应该用此法)</p>	<ol style="list-style-type: none">1) 如果公司有大量 intangible asset 则不适用(hard to value, 比如软件公司),通常这个方法的结果看作最小值; 当公司主要是 tangible assets, 或者 when the firm cease to operate and is being liquidated;2) 这种方法常用来 value private companies;3) They are increasing useful for valuing public firms that report fair values	<ol style="list-style-type: none">1) MV are usually different than book values2) Assets can be difficult to value during periods of hyperinflation
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Fixed Income

Module 1 Fixed-income securities: Defining Elements

Bonds that have no maturity date are called perpetual bonds. They make periodic interest payments but do not promise to repay the principal amount.

1) Money market securities (US treasury bills, CP, CD, etc.) Bonds with original maturities of one year or less

2) Capital market securities.

Bonds with original maturities of more than one year are referred to as

A bond with a fixed coupon rate is called a plain vanilla bond or a conventional bond.

Some bonds pay no interest prior to maturity and are called zero-coupon bonds or pure discount bonds.

A dual-currency bond makes coupon interest payment in one currency and the principal repayment at maturity in another currency.

A currency option bond gives bondholders a choice of which of two currencies they would like to receive their payments in.

Pure-discount bond: the increase in the bond's value is treated as interest income.

The provisions in the bond **indenture** (trust deed, 契约) are known as covenants (only one element of bond's indenture) include:

1) Negative covenants (prohibitions on the borrower to prevent the issuer from taking actions that could reduce its ability to make interest and principal payments; 总之是不该做的)

1.1) Restrictions on asset sales

1.2) Negative pledge of collateral

1.3) Restrictions on additional borrowing

1.4) Prohibit the issuer from investing in risky projects

2) Affirmative covenants (actions the borrower promises to perform; 总之是该做的)

2.1) Make timely interest and principal payments to bondholders

- 2.2) Ensure and maintain assets
- 2.3) Comply with applicable laws and regulations
- 2.4) What the issuer intends to do with the proceeds from the bond issue

- 1) 外国公司在本国以本国货币发行的, 称为 **foreign bonds** (通常为记名债券 **registered bond**), 比如:
 - 1.1) **panda bonds** 外国公司在中国发行的以人民币计价的债券
 - 1.2) **Yankee bonds** 非美国的公司在美国发行的以美元计价的债券
- 2) **Eurobonds (Eurodollar bonds, Euro yen bonds):** 国际债券 (**Eurobond**) 是指 计价货币和交易地不同的债券. 虽然英文名为 **Eurobond**,但它与欧元 (**Euro**) 没关系,甚至与地理上的欧洲没关系,例如一家公司 (不论公司所在地) 在新加坡发行或交易的日圆债券便是国际债券 (**Eurobond**). 国际债券通常为不记名债券 (**Bearer Bond**),也就是发行公司或政府没有把所有人名姓登录在名册上的债券,其利息也不用预扣所得税. **Eurobonds are typically subject to lower regulation than domestic and foreign bonds.**
- 3) **Global bonds:** A global bond is a bond that is **issued in several countries at the same time**. A large multinational corporation or sovereign entity with a high credit rating typically issues it. By offering the bond to a large number of investors, a global issuance can reduce borrowing cost.

Issuing entities: the credit quality can differ among related entities. **SPVs (bankruptcy remote vehicles, a separated legal entity, in the case of bankruptcy, the SPV is unaffected because it is not a subsidiary of the corporation and SPV can have a rating as high as AAA):** bonds issued by these entities (at a lower interest rate than bonds issued by the originating corporation) are called securitized bonds.

Covered bonds (资产担保券): They offer better protection than securitized bonds.

按照 **seniority**, **secured bonds (担保债券) > senior unsecured bonds (高级无抵押债券) > subordinated debt (次级债)**

Debentures refer to **unsecured debt** in US and elsewhere, in UK and other countries the term refers to bonds **collateralized** by specific assets.

Traditional MBS had a couple of problems, the biggest of which was their uncertain maturity, caused by the prepayment of principal.

The CMO was developed as a way to remedy this problem by setting up tranches to sequentially retire the debt and redirect early principal repayments to certain classes of investors. Collateralized mortgage obligations (CMOs) are structured using tranches that redistribute prepayment risk. Certain tranches are protected from receiving early principal repayments.

Credit enhancement

1) Internal:

1.1) Overcollateralization

1.2) Excess spread

1.3) Divide a bond issue into tranches (waterfall structure)

2) External:

2.1) surety bonds 履约保证(guarantee received from a third party)

2.2) Bank guarantees

2.3) Letters of credit

Profits/losses from bond sales are considered **capital gains income**, taxed at a lower rate than ordinary income.

Pure-discount bonds and other bonds sold at significant discount to par when issued are termed original issue discount (**OID**) bonds. **A portion of the discount from par at issuance is treated as taxable income each year.** It also allows that the tax basis of the OID bonds increased each year by the amount of interest income recognized, so there is **no additional capital gains tax liability at maturity.**

A typical bond has a bullet structure.

When the final payment includes a lump sum in addition to the final period's interest, it is referred to as a balloon payment.

A loan structure in which the periodic payments include both interest and some repayment of principal is called an amortizing loan.

Sinking fund provisions provide for the repayment of principal through a series of payments over the life of the issue. 好处是 less credit risk, 坏处是利率下行,被 赎回,投资者只能以低利率再投资.

Several coupon structures besides a fixed-coupon structure

1) Floating-rate notes (FRN/ floaters)

The market rate of interest is called the reference rate. FRN may have a cap (benefits the issuer) and floor (benefits the floor). An inverse floater (favored by investors who expect

decline in interest rate) has a coupon rate that increases when the reference rate decreases and vice versa.

2) Step-up coupon bonds

The coupon rate increases over time according to a predetermined schedule (protect against increase in market interest rate). Have a call feature that allows the firm to redeem the bond issue at a set price at each step-up date.

3) Credit-linked coupon bond

The coupon rate will go up by a certain amount if the credit rating of the issue falls and vice versa.

4) Payment-in-kind (PIK) bond

Pay bond interest with more bonds. Typically they have higher yields.

5) Deferred coupon bond (split coupon bond)

6) Index-linked bond

Coupon payments and/or a principal value are based on a commodity index, an equity index.

7) Inflation-linked bonds (linkers)

7.1) Indexed-annuity bonds

7.2) Indexed zero-coupon bonds

7.3) Interest-indexed bonds

7.4) Capital-indexed bonds (**TIPS, coupon rate remains constant, but coupon payment changes with par value, which is increased/decreased by the rate of inflation/deflation**)

7.5) Equity-linked notes (ETN)

8) Principal protected bonds: will not pay less than their original par value at maturity

If market yields decreases, then the issuer will call the bond and issue new bond at a lower yield. Three types of exercise for callable bonds:

1) American style – can be called anytime

2) European style – can only be called on the call date specified

3) Bermuda style – can be called often on coupon payment dates

Contingency provisions in bond indentures are referred to as embedded options.

Issuers introduce bonds with make-whole call provisions, which actually penalize the issuer for calling the bond. 还是可以被召回(如果情况特殊),而且发行的时候 yield 也比一般的 callable bond 低.

Convertible bonds: downside protection of a bond, but at a reduced yield, and the upside opportunity of equity shares. Often referred to as a hybrid security, part debt and part equity. Many convertible bonds have a call provision, and then the issuers can force bondholders to exercise their conversion option when the conversion value is significantly above the par value of the bonds. (Par value < call price < conversion value)

Warrants give the holders the right to buy the common shares at a given price over a given period of time. For a young firm, including warrants makes the debt more attractive to investors.

Contingent convertible bonds (CoCos): Bonds convert from bond to common equity automatically if a specific event occurs. European banks issue CoCos to maintain specific levels of equity financing, so if the bank's equity capital falls below a given level, they are automatically converted to common stock.

Module 2 Fixed-income Markets: Issuance, Trading, and Funding

Ratings above BBB or Baa3 (include BBB) are considered investment grade bonds.
Municipal bonds are tax exempt and are sold with lower yields.

US treasury securities are sold through single price auctions with the majority of purchases made by primary dealers.
The majority of bond trading in the secondary market is made in OTC market.

Settlement occurs on
T+0 for some money market securities
T+1 for government bonds
T+3 for corporate bonds

Sovereign bonds are **unsecured obligations** of the national government issuing the bonds; they are not backed by collateral, but by the **taxing authority of the national government**.

Spot rates are market discount rates for a single payment to be received in the future. The discount rates for zero-coupon bonds are spot rates.

Agency or quasi-government bonds are issued by entities created by national governments for specific purposes such as financing small business or providing mortgage financing. In the US, bonds are issued by government-sponsored enterprises (GSEs), such as 房利美和房地美.

World Bank, IMF, and the Asian Development Bank issue supranational bonds.

Types of debt issued by corporations

1) Bank debt

When the loan involves only one bank, it is referred to as a bilateral loan; when several banks fund the loan; it is referred to as a syndicated loan.

2) Commercial paper (short term, unsecured debt)

2.1) Interest is less than bank debt. Prices are quoted as a percentage discount from face value (**pure discount security**), while Euro Commercial Paper rates are quoted as an **add-on yield**.

2.2) CP or ECP are negotiable, which means investors can buy or sell on secondary market (主要为 large institutional investors and central banks)

2.3) ECP can be denominated in any currency, has maturity up to 1 year.

2.4) CPs are a source of funding working capital and also as a source of interim financing for long-term projects until permanent financing can be arranged. 所有公司都能发行 CP, has a maturity up to 270 days, often maintains backup lines of credit with banks.

2.5) In order to get an acceptable credit rating, corporations maintain **backup lines of credit with banks**. These are referred to as liquidity enhancement or backup liquidity lines.

Bridge financing: debt that is temporary until permanent financing can be secured.

3) Corporate bonds

An alternative to a sinking fund provision is to issue a serial bond issue. The difference is that with a serial bond issue, investors know at issuance when specific bonds will be redeemed.

For corporate bonds, maturities <5 y is short term; 5y-12y is medium term; >12y is long term.

- 4) Medium-term notes (MTNs), can have fixed or floating coupons. To combine the derivatives and notes is called a structured security.

Short term funding for banks

1) Retail deposits:

1.1) Customer deposits, money market mutual funds and savings accounts

2) Wholesale funds:

2.1) Nonnegotiable CDs **cannot** be sold and withdrawal of funds often incurs a significant penalty.

2.2) Negotiable CDs can be sold, maturities < 1 year, large denominations

2.3) Central bank funds markets

2.4) Interbank funds, unsecured

Repos

The interest cost of a repo is customarily less than the rate on bank loans or other short-term borrowing. The percentage difference between the market value and the amount loaned is called the repo margin/haircut. The repo margin is lower when the collateral security is in high demand or low supply (some lenders want to own specific bond or type of bond as collateral).

3Y2Y: 2-year forward rate three years from now.

$$(1 + S_3)^3 = (1 + 0y1y)(1 + 1y1y)(1 + 2y1y) \quad 0y1y \text{ 为 spot rate}$$

Module 3 Introduction to Fixed Income Valuation



Spot rates are the market discount rates for a single payment to be received in the future.

Full price (dirty price) = flat price (clean price) + accrued interest 先求 full price = PV *

$$(1 + \text{coupon})^{\text{days}/360}$$

再求 accrued interest = coupon * $\frac{\text{days}}{360}$

最后求 flat price = full price - accrued interest Bond dealers most often quote the flat/clean price, 不用 full price 是为了避免价格的波动性.

In some situations, the maturity effect may not hold for a low-coupon bond that is trading below par.

When calculating accrued interest (does not discount to its present value), **actual/actual** method is used most often with government bonds. The **30/360** methods are most often used for corporate bonds. When calculating spreads between government bond yields and the yield on a corporate bond, the corporate bond yield is often restated to its yield on actual/actual basis.

Matrix pricing is a method of estimating the required YTM of the bonds that are currently not traded or infrequently traded. **The benchmark rate is the YTM on a government bond with the same, or similar time to maturity.**

Street convention > stated coupon dates

True yield > actual coupon payment dates

$$\text{Current yield} = \frac{\text{annual cash coupon payment}}{\text{bond price}}$$

The option-adjusted yield 计算方法和 YTM 一样, 只是 bond current flat price + call option value.

Floating-rate note yield

- 1) Credit risk increases, quoted margin < required margin, the FRN will sell at a discount to its par value
- 2) Credit risk decreases, quoted margin > required margin, the FRN will sell at a premium to its par value
- 3) Credit risk unchanged, quoted margin = required margin, the FRN returns to its par at each reset date

其实 required margin 就是收益率, quoted margin 用来计算

coupon Coupon rate = Libor + quoted margin

Appropriate discount rate = Libor + discount margin

Note that both Libor and the margins are quoted on an annual basis, so if the bonds pay semiannually, they coupon rate should be divided by 2.

Yields for Money market instruments

LIBOR and bank CD rates are quoted as add-on yields.

US T-bill is quotes as annualized discounts from face value based on a 360-day year.

BEY is annualized add-on yield (365 days), the first step is always calculate add-on yield = discount value / present value, then add-on yield *365/360

The spot rate yield curve for US T-bill is also referred to as the zero curve or strip curve. Yields on zero-coupon government bonds are spot rates.

All bonds used to derive the par curve are assumed to have the same credit risk, periodicity, currency, and liquidity, tax status and annual yields. It can be viewed as the YTM of a par bond at each maturity date.

Forward rates are yields for future periods.3y2y is the 2-year forward rate three years from now

- 1) A yield curve constructed from a sequence of yields-to-maturity on zero-coupon bonds is the spot curve.
- 2) A par bond yield curve is constructed from the spot curve. The par curve is a sequence of yields-to-maturity such that each bond is priced at par value.
- 3) The forward curve is constructed using a series of forward rates, each having the same timeframe.

- 1) A yield spread relative to a benchmark bond is known as a benchmark spread.
- 2) A yield spread over a government bond is known as a G-spread.
- 3) Yield spreads to swap rates are known as interpolated spreads or I-spreads. I-spreads are frequently stated for bonds denominated in euros.

G-spread 和 I-spread 的缺点是只由 spot yield curve is flat 的时候所有期限的 收益率才相等. 引进 zero-volatility spread and option-adjusted spread (used for bonds with embedded options)

4) The Z-spread is the constant yield spread over the benchmark spot curve.

- 5) $OAS = z\text{-spread} - \text{option value}$ (takes the option yield component out of z-spread measure)

If it is a callable bond (option value is positive), then OAS is less than z-spread If it is a puttable bond (or the option value is negative), then OAS is larger than z-spread

Module 4 Understanding Fixed-Income Risk and Return☆☆☆

Short investment horizon: market price risk > reinvestment risk

Long investment horizon: market price risk < reinvestment risk

A bond held to maturity has no capital gain or loss. The increase in value of a zero-coupon over its life is interest income. For floating-rate security, if IR increases by 1%, the change will be related to the security's reset frequency.

Between coupon dates, the Macaulay duration of a coupon bond decreases with the passage of time and then goes back up significantly at each coupon payment date. Macaulay duration is a weighted average of the times to the receipt of cash flow.

$$1) \text{ Approximate modified duration (measure of yield duration)} = \frac{V_1 - V_2}{2 * V_0 * \Delta YTM}$$

$$2) \text{ Effective duration (measure of curve duration)} = \frac{V_1 - V_2}{2 * V_0 * \Delta curve}$$

$$3) \text{ Modified Duration} = \text{Macaulay duration} / (1 + YTM)$$

$$4) \text{ PVBP} = \frac{V_1 - V_2}{2}$$

The price value of a basis point is the money change in the full price of a bond when its YTM changes by 0.01%.

The pricing of bonds with embedded put, call or prepayment options begins with the benchmark yield curve. The appropriate measure of interest rate sensitivity of these bonds is **effective duration**.

Effective duration reflects only the sensitivity of the bond's value to changes in the benchmark yield curve. Changes in the credit spread are addressed with a separate "credit duration" measure.

An increase in a bond's YTM will decrease its interest rate risk.

Adding either a put or a call provision will decrease a straight bond's interest rate risk as measured by effective duration.

Take a weighted average (by market value) of the durations of the individual bonds in the portfolio duration. One limitation of this

method is that for portfolio duration to “make sense” the YTM of every bond in the portfolio must change by the same amount.

Money duration = annual modified duration * full price of bond position

Money duration per 100 units of par value = annual modified duration * full bond price per 100 of par value

Convexity is a measure of the curvature of the price-yield relation.

$$1) \text{ Approximate convexity} = \frac{V_1 + V_2 - 2V_0}{V_0 * (\Delta YTM)^2}$$

2) Effective convexity, like effective duration, must be used for bonds with embedded options.

A bond’s convexity is increased or decreased by the same bond characteristics that affect duration. For two bonds with equal duration, the one with cash flows that are more dispersed over time will have the greater convexity.

Callable bond has negative convexity at a low yield;
 Puttable bond has less convexity at a higher yield.

The term structure of yield volatility refers to the relation between the volatility of bond yields and their times to maturity.

- 1) When the investment horizon just matched the Macaulay duration, the effect of a change in YTM on the sale price of a bond and on reinvestment income just offset each other. 或者说, market price risk and reinvestment risk offset each other. Buy and hold: no capital gain (The redemption of principal does not expose the investor to interest rate risk).
- 2) The difference between a bond’s Macaulay duration and the bondholder’s investment horizon is referred to as a duration gap.
 - 2.1) A positive duration gap (Macaulay duration > investment horizon) exposes the investor to market price risk;
 - 2.2) A negative duration gap (Macaulay duration (investment horizon) exposes the investor to reinvestment risk.

Bond’s spread to the benchmark curve has two components:

- 1) A premium for credit risk (the risk to a bond's principal and interests)
- 2) A premium for lack of liquidity relative to the benchmark

If the bonds are sold prior to maturity, the capital gain or loss is measured by comparing the price at which the bond is sold **to the carrying value** (the original price plus the amortized amount of discount or minus the amortized amount of the premium).

Tips:

- 1) 计算 capital gain/loss 的时候,从到期日往前推算
- 2) five-year horizon yield 也是指 annualized yield

Module 5 Fundamentals of Credit Analysis

Credit risk: default risk + loss given default

- 1) Spread risk is the possibility that a bond's spread will widen due to one or both of these factors. Bond prices are inversely related to spreads; a wider spread implies a lower bond price and a narrower spread imply a higher price.
- 2) Credit migration risk/downgrade risk
- 3) Market liquidity risk: greater for the bonds of smaller issuers with relatively little publicly traded debt.

A bond's priority of claims to the issuer's assets and cash flows is referred to as its seniority ranking.

Generally the rankings are:

- 1) **First lien or first mortgage**
- 2) Senior secured debt
- 3) Junior secured debt
- 4) Senior unsecured debt
- 5) Senior subordinated debt
- 6) Subordinated debt
- 7) Junior subordinated debt

All debt within the same category is said to rank *pari passu*, or have same priority of claims.

Senior lenders have claims on the assets before junior lenders and equity lenders. However, by vote or by order of the bankruptcy court, the final plan may differ from absolute priority.

Rating agencies rate both the issuer and the debt issues. Issue credit ratings are called corporate family ratings, while issue-specific ratings are called corporate credit ratings. The issuers are rated on their **senior unsecured debt**.

S&P and Fitch rated default bond as D (C by Moody's). When a company defaults on one of its several bonds, provisions in bond indentures may trigger default on the remaining issues as well. Such a provision is called a **cross default provision**.

Notching is the practice by rating agencies of assigning different ratings to bond of the same issuer. One of the factors they consider is **structural subordination** (subsidiary is safer than the parent company). A subsidiary's debt covenants may restrict the transfer of cash or assets "upstream" to the parent company before the subsidiary's debt is serviced.

For lower-rated issuers, higher default risk leads to significant differences between recovery rates of debt with different seniority, leading to more notching.

Risks in relying on ratings from credit rating agencies

- 1) Credit ratings are dynamic
- 2) Rating agencies are not perfect
- 3) Event risk is difficult to assess.
- 4) Credit ratings lag market pricing.

Market price reflects expected losses, while credit ratings only assess default risk.

Components of 4Cs

1) Capacity (ability to repay)

- 1.1) Industry structure
- 1.2) Industry fundamentals
- 1.3) Company fundamentals

2) Collateral

- 2.1) Intangible assets, **Patents** are considered high-quality intangible assets. **Goodwill** is considered a low-quality intangible asset and is usually written down when company performance is poor.
- 2.2) Depreciation
- 2.3) Equity market capitalization
- 2.4) Human capital and intellectual capital

3) Covenants

3.1) Affirmative covenants: pay interest, principal, and taxes; carrying insurance on pledged assets; and maintaining certain financial ratios within prescribed limits.

3.2) Negative covenants: restrict the borrower from incurring additional debt or directing cash flows to shareholders in the form of dividends and stock repurchases.

4) Character

Management's business qualifications and operating record

4.1) Soundness of strategy

4.2) Track record

4.3) Accounting policies and tax strategies

4.4) Fraud and malfeasance record

4.5) Prior treatment of bondholders

Ratio analysis (part of capacity analysis)

1) Profit and cash flows

1.1) EBITDA.

1.2) Funds from operations, similar to CFO except that FFO exclude changes in working capital.

1.3) Free cash flows before dividend.

1.4) Free cash flows after dividend.

2) Leverage ratios

2.1) Debt/capital (capital = total debt + shareholder's equity)

2.2) Debt/EBITDA

2.3) FFO/debt

3) Coverage ratio

3.1) EBITDA/interest expense. This is more often used than the EBIT/interest expense ratio. This ratio will be higher than EBIT/interest expense ratio

3.2) EBIT/interest expense (interest coverage ratio, also Times interest earned ratio)

Yield spreads on corporate bonds are affected primarily by five interrelated factors:

1) Credit cycle

2) Economic conditions

3) Financial market performance

4) Broker-dealer capital

5) General market demand and supply

Credit curves or spread curves show the relationship between spread and maturity. Because longer maturity bonds tend to have wider spreads, credit curves typically upward sloping.

Special considerations for high yield bonds:

- 1) Liquidity. Liquidity is critical for high yield issuers.
- 2) Financial projections
- 3) Debt structure

High yield companies for which secured bank debt is a high proportion of the capital structure are said to be **top heavy** and have less capacity to borrow from banks in financially stressful periods. Companies that have top-heavy capital structures are more likely to default and have lower recovery rates for unsecured debt issues.

- 4) Corporate structure
- 5) Covenants

5.1) Change of control put. This covenant gives debt holders the right to require the issuer to buy back debt in the event of an acquisition.

5.2) Restricted payments. Limit the amount of cash that may be paid to equity holders.

5.3) Limitations on liens. The covenant limits the amount of secured debt that a borrower can carry.

5.4) Restricted versus unrestricted subsidiaries. **Restricted subsidiaries' cash flows and assets can be used to service the debt of the parent holding company.** This benefits creditors of holding companies because their debt is pari passu with the debt of restricted subsidiaries, rather than structurally subordinated. Restricted subsidiaries are typically the holding company's larger subsidiaries that have significant assets.

Sovereign debt

Bondholders usually have no legal recourse if a national government refuses to pay its debts.

Basic framework for evaluating sovereign credit rating:

- 1) Institutional effectiveness
- 2) Economic prospects
- 3) International investment position
- 4) Fiscal flexibility
- 5) Monetary flexibility

Credit rating agencies assign each national government two ratings:

- 1) A local currency debt rating
- 2) A foreign currency debt rating

Municipal Debt

Classified as general obligation bonds or revenue bonds

- 1) GO bonds are unsecured bonds backed by the full faith credit of the issuing government entity, which is to say they are supported by its taxing power.
- 2) Revenue bonds finance specific projects. Revenue bonds often have higher credit risk than GO bonds because the project is the sole source of funds to service the debt. A key metric for revenue bonds is the debt service coverage ratio (DSCR)

$$\text{DSCR} = \frac{\text{Net Revenue (project)}}{\text{required interest and principal payments}}$$

Derivatives

Derivative Markets and Instruments

A dealer market with no central location is referred to as an OTC market. Some options trade in the OTC market, notably bond options.

Forward commitments include forward contracts, futures contracts, and swaps. Forward contracts provide the **obligation** to do something.

A contingent claim (options, credit derivatives) is a claim that depends on a particular event. **It takes two options to replicate a future or forward.** Option sellers have an obligation to do something while option buyers have the right to do something. Main differences with forwards are futures are traded in an active secondary market, are regulated, backed by the clearinghouse, and require a daily settlement of gains and losses.

The option premium represents the value of the option, whereas futures and forwards have a value of zero at the initiation of the contract.

A swap is a series of forward contracts.

Credit spread option, typically a call option that is based on a bond's yield spread against a benchmark. If its yield spread increases then the bondholder will collect a payoff on the option.

Derivative market has **greater liquidity** than the underlying market. Derivatives also have **lower transaction costs and lower capital requirements** than the underlying.

Benefits of derivatives:

- 1) Provide price information
- 2) Allow risk to be managed and shifted among market participants
- 3) Reduce transaction costs

Arbitrage opportunities arise when assets are mispriced.

- 1) Law of one price
- 2) Two securities with uncertain returns can be combined in a portfolio that will have a certain payoff.

Forward Markets and Contracts

At any point in time, including the settlement date, only one party to the forward contract will owe money.

Deliverable forward contract

Cash settlement

A party to a forward contract can terminate the position prior to expiration by entering into an opposite forward contract with an expiration date equal to the time remaining on the original contract. You can enter into the second (offsetting) contract with **the same party** as the original contract.

The end user of a forward contract is typically a corporation, government unit, or non-profit institution.

Dealers are often banks. Bid/ask spread is the dealer's compensation for administrative costs as well as bearing default risk and any asset price risk from un-hedged positions.

A forward contract on a stock index is similar except that the contract will be based on a notional amount and will very likely be a **cash-settlement** contract.

Equity forward contracts do not have a maturity date, while bonds do, and forward bond contract must settle before the bond matures. The price specified in forward contracts on coupon-bearing bonds is typically stated as YTM as of the settlement date, exclusive of accrued interest.

Eurodollar deposits are the term for **deposits in large banks outside the United States** denominated in US dollars. **The lending rate on dollar-denominated loans between banks is called LIBOR.** It is quoted as an annualized rate based on a 360-day year. In contrast to T-bill discount yields, LIBOR is an add-on rate.

Euribor, established in Frankfurt, is published by the ECB.

A Forward rate agreement can be viewed as a forward contract to borrow/lend money at a certain rate at some future date.

2x5 FRA means the contract will expire in 2 months and using 3month LIBOR.

payment to the long at settlement

$$= (\text{notional principal}) * \frac{(\text{floating} - \text{forward}) * (\frac{\text{days}}{360})}{1 + \text{floating} * (\frac{\text{days}}{360})}$$

Days= number of days in the loan term (**same as the number in front of LIBOR**) FRAs for non-standard period (45-day FRA on 132-day LIBOR) are termed **off-the-run** FRAs.

Future Markets and Contracts

The maximum price limits expand during periods of high volatility and are not in effect during the delivery month. The exchange also sets the trading times for each contract.

Uniformity promotes market liquidity.

Clearinghouse allows either side of the trade to reverse positions at a future date **without having to contact the other side** of the initial trade.

In the futures market, both the long and the short investors deposit margins.

- 1) Initial margin: **performance bond ensuring fulfilling of the obligation**
- 2) In the futures contract account, maintenance margin requires investors to bring the margin balance back up **to the initial margin requirements**; In the equity account, maintenance margin requires investors only to bring the margin up **to the maintenance level**.
- 3) Variation margin. 在交保证金的时候, 当天低于 maintenance requirement 没关系, 第二天才会要求补上.

In future contract, the short holds the right to make decisions about when/where to deliver. The short initiate the delivery process, and actual delivery typically can occur on any business day of the delivery month.

The Fed sets initial and minimum margins in securities accounts;
 The clearinghouse sets those in the futures markets.

The mechanism by which supply and demand determine this equilibrium is open outcry at a particular location on the exchange floor called a **pit**.

Marking-to-market is the process of adjusting the margin balance in a futures account each day for the change in the value of the contract assets from the previous trading day, based on the new settlement price.

Four ways to terminate a futures contract:

- 1) Delivery (very rare), initiated by the short and the delivery can take place any business day during the delivery month.
- 2) Cash-settlement contract
- 3) Make a reverse, or offsetting.
- 4) Exchange for physicals. The traders actually exchange the goods, the contract is not closed on the floor of the exchange, and the two traders privately negotiate the terms of the transaction. Regular delivery involves only one traders and the clearinghouse. You must then contact the clearinghouse and tell them what happened.

Delivery options in futures contracts

These options can be of significant value to the holder of the short position in a futures contract.

- 1) **Treasury bill futures** (折价发行, 没有利息) contracts are based on a \$1m face value **90-day T-bill** and settle in cash. The price quotes are 100 minus the annualized discount in percent on the T-bills. If you short position and the T-bill price increase then you make a loss (as normal).
- 2) **Eurodollar futures** are based on **90-day LIBOR**, which is an add-on yield. The minimum price change is one tick, which is 0.01%. Long positions gain when interest rate decreases (as normal).
The IMM index price for a Eurodollar future is 95.23, then the annualized LIBOR rate is 4.77%, then the actual price is $\$1m * [1 - 0.0477 * (90/360)] = \$988,075$ (1 basis point = \$25)
- 3) **Treasury bond futures** contracts are traded with maturities **greater than 15 years**. Have a face value of \$100,000, and are quoted as a percent and fractions of 1% of face value. Each bond is given a conversion factor (multiplied by the future price to determine the delivery price).
- 4) **Treasury notes** 中期债券, 有 coupon. Commercial paper 折价发行没有利息.

Stock index future -- Settlement is in cash and is based on a **multiplier of 250**. Currency futures-- Contracts are set in units of the foreign currency, and the price is stated in USD/unit.

Option Markets and Contracts

After issuance, **stock option contracts are adjusted for stock splits but not cash dividends**.

Most exchange-traded options have expiration dates within two or four months of the current date. Exchanges also list long-term equity anticipatory securities (**LEAPS**), which are equity options with **expiration dates longer than one year**.

Most interest rate options are European options. If the rate is for less than one year, the payoff is adjusted.

A long interest rate call combined with a short interest rate put can have the same payoff as a long position in an FRA.

- 1) An interest rate cap is a series of interest rate call options, having expiration dates that correspond to the reset dates on a floating-rate loan. Caps are often used to **protect a floating -rate borrower from an increase in interest rates**. Caps pay when rates rise above the cap rate. A cap can be viewed as a series of interest rate call options with strike rates equal to the cap rate. Each option in a cap is called a **caplet**.
- 2) An interest rate floor on a loan operate has just the opposite effect of a cap. Each option in a floor is called floorlet.
- 3) An interest rate collar combines a cap and a floor. The issuer of a collar **long a cap and short a floor**. The note issuer **receives a payment when rates are above the cap**, and **makes an additional payment when rates are below the floor**.

The payoff of a forward rate agreement is paid immediately when the contract expires.

The payoff on interest rate options, the payment is made not at option expiration, but at future date corresponding to the term of the reference rate. For example, an option based on 90-day LIBOR will make a payment 90 days after the expiration date of the option.

An option's intrinsic value is the amount by which the option is in the money. Options are a zero-sum game.

Option value = intrinsic value(即比较 strike and stock price) + time value

Option	Minimum value	Maximum value
European call	$C_t \geq \max\left[0, S_t - \frac{X}{(1 + RFR)^{T-t}}\right]$	S_t
American call	$C_t \geq \max\left[0, S_t - \frac{X}{(1 + RFR)^{T-t}}\right]$	S_t
European put	$P_t \geq \max\left[0, \frac{X}{(1 + RFR)^{T-t}} - S_t\right]$	$\frac{X}{(1 + RFR)^{T-t}}$
American put	$C_t \geq \max[0, X - S_t]$	X

S=underlying price

X=strike price

只要记住 minimum 的就好了, maximum 是它的第一项

注意这里算天数的时候以 365 天为基准.

Call prices are inversely related to exercise price

Put prices are directly related to exercise price

Put-call parity: $C + \frac{X}{(1+RFR)^T} = S + P$

(This formula can be used to determine the effect of interest rate change on an option's price)

The options must be European-style and the puts and calls must have the same exercise price for these relations to hold.

A fiduciary call is a combination of a pure-discount, riskless bond that pays X at maturity and a call with exercise price X.

A protective put is a share of stock together with a put option on the stock.

For assets with positive cash flows over the term of the option, we can substitute this (lower) net cost, $S - PV_{CF}$.

Swap Markets and Contracts

Swaps are agreements to exchange a series of cash flows on periodic settlement dates over a certain time period. *A swap has zero value at the start of the contract.* The length of the swap is

termed the **tenor of the swap**. *A swap can be decomposed into a series of forward contracts (FRAs) that expire on the settlement dates.*

Four ways to terminate a swap:

- 1) Mutual termination
- 2) Offsetting contract
- 3) Resale. This would be unusual as there is not a functioning secondary market.
- 4) Swaption

1) Currency swaps

These settlement payments are both made. They are not netted as they are in a single currency interest rate swap.

Steps (fixed-for-fixed currency swap):

- 1.1) Notional principal is swapped at initiation.
- 1.2) Full interest payments are exchanged at each settlement date, each in a different currency.
- 1.3) Notional principal is swapped again at the termination of the agreement.

2) Interest rate swaps

The plain vanilla interest rate swap involves trading fixed interest rate payments for floating-rate payments. A basis swap involved trading one set of floating rate payments for another.

Notional principal is generally not swapped in single interest rate swaps. Net interest is paid by the one who owes it.

At the conclusion of the swap, there is no transfer of funds.

Swaps are a zero-sum game.

3) Equity swaps

The return can be the capital appreciation or the total return including dividends on the stock, portfolios, or index.

Equity swap payments can be floating on both sides and the payments are not known until the end of the quarter. With interest rate swaps, both the fixed and floating payments are known as the beginning of period for which they will be paid.

Risk Management Applications of Option Strategies

Write a covered call (long stock, sell call)

You feel the stock price will not go up any time soon, and you want to increase your income by collecting the call option

premium. The call writer is trading the stock's upside potential for the call premium.

Protective put (long stock, long put)

A protective put is an investment manager technique designed to protect a stock from a decline in value. It is constructed by buying a stock and put option on that stock.

Alternative Investments

Module 1 Categories, Characteristics, and Compensation Structures of Alternative Investments

Alternative investments as a group have had low returns correlations with traditional investments. Compared to traditional investments, alternative investments exhibit:

- 1) Less liquidity of assets hold
- 2) More specialization by investment managers
- 3) Less regulation and transparency
- 4) More problematic and less available historical return and volatility data
- 5) Different legal issues and tax treatments

Alternative investments

- 1) Hedge fund, they do not necessarily hedge risks as the name imply.
- 2) Private Equity funds
- 3) Real Estate includes **residential or commercial properties as well as real estate backed debt.**
- 4) Commodities
- 5) Other

Module 2 Performance Calculation and Appraisal of Alternative Investments

Hedge funds

Like Private Equity fund, hedge funds are typically set up as **limited partnership**, with the investors as the **limited partners**. The

management firm is the general partner and typically receives both a management fee based on the value of assets managed and an incentive fee based on fund returns.

Restrictions on redemptions may include a **lockup period** and a **notice period**. A lockup period is a time after initial investment during which withdrawals are not allowed. A notice period, typically 30 to 90 days, is the amount of time a fund has after receiving a redemption request to fulfill the request. Additional fees may be charged at redemption.

Fund of funds managers (**provide more due diligence and better redemption terms**) charge an additional layer of fees beyond the fees charged by the individual hedge funds in the portfolio.

Hedge fund fees (2 and 20)

1) **Management fee is based on invested capital, rather than committed capital.**

2) **Incentive fee**

A hard hurdle rate means incentive fees are earned only on returns in excess of the benchmark.

A soft hurdle rate means that incentive fees are paid on all profits, but only if the hurdle rate is met.

A high water mark

The incentive fee is not paid on gains just offset prior losses, thus incentive fees are only paid to the extent that the current value is above the highest value previously recorded.

Investors in funds of funds incur additional fees from the managers of the funds of funds. A 1% management fee and a 10% incentive fee are charged in addition to any fees charged by the individual hedge funds within the fund-of-funds structure.

Key items for Due diligence for alternative investments

- 1) Organization
- 2) Portfolio management
- 3) Operations and controls
- 4) Risk management
- 5) Legal review
- 6) Fund terms

当把股票加入 A+B 中时, the most important factor is the average covariance of C with the returns of A+B.

VaR and the Sortino ratio are measures of downside risk.

Tips: 答案中违反两种规则的, 倾向于选择只违反一个规则的选项。

Module 3 Private Capital, Real Estate, Infrastructure, Natural Resources, and Hedge Funds

Strategy

1) Event-driven

strategies 1.1)

Merger arbitrage

1.2) Distressed/restructuring

1.3) Activist shareholders

1.4) Special situation

2. Relative value

strategies 2.1)

Convertible arbitrage

2.2) Asset-backed fixed income (exploit pricing discrepancies among

various MBS or ABS.

2.3) General fixed income

2.4) Volatility (exploit differences between returns volatility implied by

options prices and manager expectations of future volatility).

2.5) Multi-strategy

3. Macro strategies

4. Equity hedge fund strategies

4.1) Market neutral (select undervalued/overvalued equities)

4.2) Fundamental growth (use fundamental analysis to find high-growth companies).

4.3) Fundamental value (use fundamental analysis to find undervalued companies)

4.4) Quantitative directional (use technical analysis)

4.5) Short bias

Hedge fund valuation

Hedge fund values are based on market values for traded securities in their portfolios, but must use model values for non-traded securities. **Some funds calculate a "trading NAV" using such adjustments for illiquidity. Trading NAV is different from the**

calculated NAV required by accounting standards, which is based on either market or model prices.

Private Equity

The majority of private equity invests either in private companies or public companies they tend to take private, or in early stage companies. Two smaller categories are **distressed investment funds** and **developmental capital funds**.

Strategies

Leveraged buyouts, which means primarily bank debt, high-yield bonds, or mezzanine financing funds the purchase of the portfolio company.

Two types of LBOs (**firms with high cash flow, low leverage and large amount of physical assets** are attractive LBO candidates)

- 1) MBOs, in which the existing management team is involved in the purchase
- 2) Management buy-ins (MBIs), in which an external management team will replace the existing management team.

Venture capital funds invest in companies in the early stages of their development. VC fund managers often **sit on their boards or filling key management roles**.

Different company stages:

1) Formative stage

*1.1) Angel investing, often **the idea stage**, the funds are used for business*

plans and assessing market potential. The funding source is usually individuals rather than VC funds.

*1.2) Seed stage refers to **the investments made for product development**,*

marketing and market research (产品开发, 市场研究). This is typically the stage during which VC funds make initial investments, through ordinary or convertible preferred shares.

*1.3) Early stage refers to investments made to fund **initial commercial***

production and sales (开始生产).

2) Later stage. Funds are used for **expansion** of production or sales.

3) Mezzanine financing refers to capital provided to prepare the firm for an IPO. **Mezzanine financing** refers to debt or preferred

shares that are subordinate to the high-yield bonds issued and carry warrant or conversion features that give investors participation in equity value increase.

Other strategies

- 1) Developmental capital / minority equity investing/ PIPE
- 2) Distressed investing
- 3) Investors often take an active role in the turnaround by working with management.

Private Equity Structure and Fees

Private Equities are structured as **limited partnership**.

Management fees are typically 1% to 3% of committed capital, rather than invested capital. This is in contrast to hedge funds, for which the management fee is based on invested capital. Incentive fees are typically 20% of profits, but the fees are not earned until **after the fund has returned investors' initial capital.**

Private Equity exit strategies

The average holding period for companies in PE portfolio is 5 years.

- 1) Trade sale (sell to a competitor)
- 2) IPO
- 3) Recapitalization
- 4) Secondary sale (sell to another PE firm)
- 5) Write-off/liquidation

PE portfolio company valuation

- 1) Market/comparable approach
- 2) Discounted cash flow approach
- 3) Asset-based approach

Real Estate

- 1) Residential property – single family homes
- 2) Commercial property – produces income
- 3) Mortgage loans

Forms of Real Estate investment

- 1) Residential property is a direct investment in real estate.
Property purchased with a mortgage is referred to a leveraged investment and **the owner's equity is the property value minus the outstanding loan amount.**
- 2) Commercial real estate

Long time horizons, illiquidity, the large size of investment needed, and the complexity of the investments make commercial real estate inappropriate for many investors.

- 3) Real estate investment trusts
- 4) Timberland
- 5) Farmland

Three types of indices measure real estate performance:

- 1) An appraisal index (评估指数, **lowest standard deviation**), prepared by National Council of Real Estate Investment Fiduciaries (**NCREIF**).
- 2) Repeat sales index (an example of sample selection bias)
- 3) REIT indices (和股指走势相近) 3.1) Mortgage REIT does not invest in real estate directly. They make real estate loans.
3.2) Equity REIT, invest directly in properties.

REIT index returns and global equity returns have had a relatively strong correlation. The correlation between global bond returns and REIT returns has been very low historically.

Real estate valuation

- 1) Comparable sales approach

2) Income approach

$$\frac{\text{net operating income}}{\text{capitalization rate}}$$
 (

分子不包括折旧interest and tax; 分母为□□□□□□rate of return)

- 3) Cost approach

Commodities

Futures, forwards, options, and swaps; other methods of exposures to commodities include:

- 1) ETF
- 2) Equities that are linked to a commodity, one potential drawback are the price movement of a stock and the commodity may not be perfectly correlated.
- 3) Managed future funds
- 4) Individual managed accounts
- 5) Specialized funds in specific commodity sectors

Returns and sharp ratio for commodities has been lower than stocks or bonds. Holding commodities can act as a hedge of inflation risk.

Spot prices for commodities are a function of supply and demand.

Commodity futures price

= Spot price (1+RFR) + storage costs – convenience yield

Convenience yield is the value of having the physical commodity for use over the period of the future contract. (在期货合同持有实物的收益率)

Three sources of commodities futures returns are (**no convenience yield**):

- 1) Roll yield, positive for a market in backwardation and negative for a market in contango.
- 2) Collateral yield
- 3) Change in spot prices

Changes in the underlying commodity's price > least likely to be directly reflected in the returns of commodity index.

Other alternative investments

Rare wines, art, rare coins and stamps, valuable jewelry and watches, and sports memorabilia

Portfolio Management

Module 1 Portfolio Management: An Overview

Portfolios reduce risk more than they increase returns. In other words, they affect risk more than returns.

- 1) Individual investors

Below two have long investment horizons (永久年限,一般是最长的), high risk tolerance, and little need for additional liquidity.

Endowment 捐赠会

Foundation 基金会

- 2) Banks keep risk low and need adequate liquidity to meet investor withdrawals as they occur.

- 3) Life insurance companies have a **relatively** long-term investment horizon, while property and casualty insurers have a shorter investment horizon because claims are expected to arise sooner than for life insurers.

- 4) Investment companies manage the pooled funds of many investors.

5) Sovereign wealth funds refer to pools of assets owned by a government.

Defined contribution pension plan: decisions are left to employees, who assume all of the investment risks.

Defined benefit pension plan: the employer assumes the investment risk. Although DB plans have a need for income, the need for liquidity is low.

Steps in the portfolio management process:

Step 1 planning step: 风险,收益目标,流动性,税收,benchmark. IPS should be updated at least every few years and any time the investor's objectives or constraints changes significantly.

Step 2 Execution step: 决定组合分配问题, top-down analysis; 然后再某一资产 分类挑选标的,使用 bottom-up analysis.

Step 3 Feedback step: rebalance

Mutual funds are one form of pooled investments.

1) With an open-end fund (**do not have brokerage fees**), all mutual funds charge a fee for the ongoing management of the portfolio assets; no-load funds do not charge up-front fees or redemption fees; load-funds charge either, or both.

2) With a closed-end fund, the shares of a closed-end fund trade like equity shares. 与开放式一样,也收取管理费(actively managed).

Types of mutual funds

1) Money market funds

2) Bond mutual funds

3) Index funds

4) Actively managed funds have higher turnover portfolio securities, which lead to greater tax liabilities compared to index funds.

Other forms of pooled investment (parallel to Mutual Funds)

1) ETFs track benchmark, 而且 special redemption provisions are designed to keep their market prices very close to their NAVs.

ETF 交易很灵活,但是开放式基金只能根据收盘价交易;

ETF 要支付佣金和点差;

ETF 支付现金红利,而开放式基金可以将红利再投资;

ETF may produce less capital gains liability compared to 开放式基金.

总结：开放式基金于当日收盘 NAV 交易，而封闭式 (NAV could differ **significantly** due to imbalances between investor supply and demand)和 ETF can trade at a premium or a discount.

2) A separately managed account

3) Hedge funds

3.1) Long/short funds

3.2) Equity market-neutral funds

3.3) Event-driven funds

3.4) Fixed-income arbitrage funds

3.5) Convertible bond arbitrage funds

3.6) Global macro funds

4) Buyout funds (private equity funds) buy entire public company and take them private. Only make **a few** large investments, 最终目的是 increase cash flow ,pay down its debt, increase the value of its equity, and then sell in IPO over 3 to 5 years.

5) Venture capital (**do not typically restructure companies**) funds invest in companies in their start-up phase; invest in **many small companies**, with the expectation that only a few will go to IPO.

Both buyout funds and venture capital funds are very involved in the management of their portfolio companies and often have expertise in the industries on which they focus.

Module 2 Portfolio risk and return: Part 1☆☆☆

Gross return 包括管理费用,但是不包括交易费用; net return 不包括管理和交易 费用

Real return is nominal return adjusted for inflation. Because annual inflation fluctuated greatly over the period, real return has been much more stable than nominal returns.

A leveraged return refers to a return that is a multiple of the return on the underlying asset.

The negative skew reflects a tendency towards large downside deviations, while the positive excess kurtosis reflects frequent extreme deviations on both the upside and downside.

A risk-averse investor is simply one that dislikes risk (i.e., prefer less risk to more risk). 相同收益下,会选择风险较小的.

A risk-seeking investor prefers more risk to less. 相同收益下,会选择风险较大的. A risk-neutral investor has no preference regarding risk

and would be indifferent between two such investments. 风险中立的投资者会选择收益回报最高的组合。

The lower the correlation of asset returns, the greater the risk reduction benefit of combining assets in a portfolio. The desire to reduce risk is what drives investors to invest in not just domestic stocks, but also bonds, foreign stocks, real estate, and other assets.

$$\text{Utility function } U = E(r) - \frac{1}{2} AG^2$$

Based on the function, a risk-free asset will generate a numerical utility that is the same for all individuals. 不管是风险厌恶, 追逐和中性, 投资者都寻求效用最大化。

A more risk-averse investor will have steeper indifference curves. Combining a risky portfolio with a risk-free asset is the process that supports the two-fund separation theorem. The line representing these possible combinations of risk-free assets and the optimal risky asset portfolio is referred to as the CAL. 在 CAL 上, 越往右风险越大; 无差异曲线, 越陡峭越风险厌恶; CAL 和 IC 可以决定资产配置。(横轴是 total risk G; 纵轴是 expected return)

题目中 annualized return 的时候, 使用连续复利

$$\text{Real rate of return} = \frac{1 + \text{Geometric return}}{1 + \text{inflation rate}}$$

Module 3 Portfolio risk and return: Part 2

真实情况下, each investor will have a different optimal risky asset portfolio and a different CAL;

理想情况下, investors have homogeneous expectations and have the same optimal risky portfolio and CAL. 这时候的 CAL 也称之为 CML. 横轴是 total risk, 只有 efficient portfolio 才会在 CML 上; theoretically, **any point above the CML is not achievable and any point below the CML is dominated by and inferior to any point on the CML.**

Unsystematic/unique/diversifiable/firm-specific risk

Systematic risk/non-diversifiable/market risk

Total risk = systematic risk + unsystematic risk

The riskiest stock, with risk measuring as standard deviation of returns, does not necessarily have the greatest expected return. 因为持有非系统性风险是没用的, 它可以 zero 成本分散掉, 只有系统性风险才能产生收益.

Return generating models are used to estimate the expected returns on risky securities based on specific factors.

Multifactor model: FAMA and French, estimated sensitivity of security returns to three factors: firm size; firm book value to market value ratio, and the market excess return.

Market model: $R_i = a_i + F_i R_m + e_i$

$$F_i = \frac{\text{Cov}(i,m) U_i}{\sum \frac{P_{im}}{U_m U_m}}$$

SML 针对单支股票, 横轴是 systematic risk ---Cov(i .m), 纵轴是 expected return;

将横轴除以 G_m^2 , 即为 F_i , 即得到 CAPM 的图形 (the relationship between beta and expected return).

In CAPM world, all properly priced securities and portfolios of securities will plot on the SML.

Remember, all stocks should plot on the SML (通过 CAPM 计算的 return 再 SML 上); any stock not plotting on the SML is mispriced. If the estimated return plots over the SML, it is under-valued; if it plots under the SML, it is over-valued.

Formally, the CAPM is stated as: $E(R_i) = R_f + F_i [E(R_m) - R_f]$
The security market line is a graphical representation of the CAPM with beta on the x-axis and expected return on the y-axis. The slope of the line is given by the market risk premium.

The assumptions of CAPM are:

- 1) Risk aversion
- 2) Utility maximizing investors
- 3) Frictionless markets
- 4) **One-period horizon**
- 5) Homogeneous expectations
- 6) Divisible assets
- 7) Competitive markets
- 8) Security prices are not affected by investor trades
- 9) An investor can invest as much as he or she desires in any asset.

以下四个经常被用来比较主动型和被动型基金经理的表现：

Based on total risk (based on CML):

1) The sharp ratio is its excess returns per unit of total portfolio risk. Note sharp ratio is only useful when compared with the SR of another portfolio.

2) The M-squared measure produces the same portfolio ranking as the sharp ratio but is stated in percentage terms.

Based on beta (based on SML):

Treynor measure (类似 sharp ratio) and Jensen's alpha (类似 M-squared)

If a single manager is used, then the total risk is relevant; if multiple managers were used, then systematic risk would be more relevant.

Module 4 Basics of portfolio planning and Construction

A written investment policy statement will typically begin with the investor's goals in terms of risk and return.

The major components of an IPS (至少要求 1, 7, 8 这三点):

- 1) **Description of client circumstances and situation**
- 2) Statement of the purpose of the IPS
- 3) Statement of duties and responsibilities of investment manager, custodian of assets and the client
- 4) Procedures to update IPS
- 5) Investment objectives
- 6) Investment constraints
- 7) **Investment guidelines, such as asset type permitted and leverage to be used**
- 8) **Evaluation of performance, the benchmark**
- 9) Appendices, strategic asset allocation, how and when the portfolio allocations should be rebalanced

Absolute risk objective: a return of 3% more than the annual inflation rate each year.

Relative risk objectives: no greater than a 5% probability of returns more than 4% below the return on the MSCI World Index over any 12-month period.

If the investor's willingness to take on investment risk is high but the investor's ability to take on risk is low, the low ability to take on investment risk will prevail in the adviser's assessment. 反之的话,可以适当教育投资者,但不能试图诱导或者改变.基本上,按照意愿和能 力中低的那个来.

A written IPS is best seen as a communication instrument allowing clients and portfolio managers to mutually establish investment objectives and constraints.

Investment objectives:

- 1) Return requirements
- 2) Risk tolerance

Investment guidelines:

- 1) policies regarding permitted asset types and the leverage.

Investment constraints (RRTTLLU):

- 1) Risk
- 2) Return
- 3) Time horizon: the longer, the more risk and less liquidity
- 4) Tax situation: investors subject to higher tax rates may prefer tax-free bonds to taxable bonds or prefer equities that are expected to produce capital gains, which are often taxed at lower rate than other types of income.
- 5) Liquidity: illiquid investments in hedge funds and private equity funds are not suitable for an investor who needs access to the funds.
- 6) Legal restrictions: corporate officers and directors face legal restrictions on trading in the securities of the firms.
- 7) The unique constraints of a specific investor

Alternative investment asset class includes hedge funds of various type, private equity funds, managed or passively constructed commodity funds, artworks, and intellectual property rights.

- 1) Strategic asset allocation
- 2) Tactical asset allocation (短期机会, underweight or overweight)
tactical asset allocation **allows actual asset allocation to deviate from that of the strategic asset allocation** of the IPS. Tactical asset allocation attempts to take advantage of temporary dislocations from the market conditions and assumptions that drove the policy portfolio decision.
- 3) Security selection

Risk budgeting sets an overall limit for the portfolio and allocates a portion of the permitted risk to the systematic risk of the strategic asset allocation, the risk from tactical asset allocation, and the risk from security selection.

Core-satellite approach: 大部分被动管理,小部分主动管理

Module 5 Technical Analysis

A key assumption of technical analysis is that market prices reflect both rational and irrational investor behavior. This implies that the efficient market hypothesis does not hold. (It only cares about the price and volume)

技术分析在流动性不好的市场中应用有限制, 因为标的容易被操纵.

A **downtrend line** is constructed by drawing a line **connecting the highs of the price chart.**

An **upward line** is constructed by drawing a line **connecting the lows of the price chart.**

反转类型指标: head-and-shoulders (Volume is important in interpreting the data in terms of the head and shoulders pattern), double top, triple top, inverse head-and-shoulders, double bottom and triple bottom.

持续类型指标: Triangles (三角形 suggests buying and selling pressure have become roughly equal temporarily), Rectangles(矩形 Flags and pennants refer to 矩形和三角形 that appear on short-term charts).

Price-based Indicators:

- 1) Moving average lines
- 2) Bollinger bands are constructed based on the standard deviation of closing prices over the last n periods. (Contrarian strategy)

Oscillators (动量摆动指标)

Oscillator charts can be used to identify convergence or divergence of the oscillator and market prices. Convergence suggests the price trend is likely to continue, while divergence may indicate a potential change in the price chart.

- 3) ROC (buy when it changes from negative to positive during an uptrend in prices, and vice versa).

4) RSI (The relative strength index (RSI) is a momentum oscillator and provides information on whether or not an asset is overbought or oversold. An RSI greater than 70 indicates that a stock is overbought; an RSI lower than 30 suggests that a stock is oversold).

5) MACD (MACD line cross above the signal line is a buy, MACD is the difference between two exponentially smoothed moving average of the price, and the signal line is an exponentially smoothed moving average of MACD line)

6) Stochastic oscillator uses two lines that are bounded by 0 and 100; it is used to identify overbought and oversold markets.

Non-price-based indicators

Put/call ratio (反向指标), VIX, Margin debt (同向指标), Short interest ratio (不一定) 短期交易指数 $TRIN = (\text{advanced issues}/\text{declining issues}) / (\text{Volume of advancing issues}/\text{volume of declining issues})$ A value below 1 is bullish as it means more volume is in rising shares than in declining ones.

Mutual fund cash position (反向指标)

IPO (反向指标)

Kondratieff wave: 54 年大周期

Decennial theory: 5 结尾的年份表现好于 0 结尾的年份

US presidential cycle theory: 总统选举后的第三年股市表现好, 为了第 4 年的重新选举.

Elliott wave theory (Fibonacci ratio): in a prevailing uptrend, upward moves in prices consist of 5 waves and downward moves occur in 3 waves. In a prevailing downtrend, downward moves in prices consist of 5 waves and upward moves occur in 3 waves.

Inter-market analysis: RSI

Ethical and Professional Standards

Module 1: Ethics and Trust in the Investment Profession

CFA institute Professional Conduct Program

Inquiry can be prompted by:

- 1) Self-disclosure
- 2) Written complaints
- 3) Evidence of misconduct
- 4) Report by a CFA exam proctor

The designated officer may decide:

- 1) No disciplinary sanctions are appropriate
- 2) To issue a cautionary letter
- 3) To discipline the member or candidate

If the candidate does not accept the proposed sanction, the matter is referred to a hearing panel composed of hearing panel.

Sanctions may include condemnation by member's peers or suspension of candidate's participation in the CFA program

Module 2: Code of Ethics and Standards of Professional Conduct

The code of ethics

Six components:

- 1) Act in an ethical manner
- 2) Integrity is paramount and clients always come first
- 3) Use reasonable care; be independent
- 4) Be a credit to the investment profession
- 5) Uphold capital market rules and regulations
- 6) Be competent

Module 3: Guidance for Standards I–VII

Standard I : Professionalism

A. Knowledge of the Law

- 1) Understand and comply with all laws, rules, and regulations (including Code and Standards) of any government, regulatory agency, or association governing professional activities
- 2) Comply with more strict law, rule, and regulation

3) Do not knowingly assist in violation, otherwise dissociate from activity.

Guidance

- 1) Most strict
- 2) First, notify supervisor or compliance
- 3) May confront wrongdoer directly
- 4) Dissociate if necessary
- 5) Inaction may be construed as participation (不行动是不对的)
- 6) No requirement to report violations to governmental authorities, but this may be appropriate in certain cases

Recommended Procedures

- 1) Keep informed, regularly review written compliance procedures, maintain files
- 2) Seek compliance/legal advice as needed
- 3) Encourage firms to adopt code of ethics
- 4) Distribute information internally on applicable laws and regulations
- 5) Have written procedures for reporting suspected violations
- 6) Members strongly encouraged to report violations by other members 对其他成员 要检举揭发

B. Independence and Objectivity

- 1) Use reasonable care, judgment to achieve and maintain independence in professional activities
- 2) Do not offer, solicit, or accept any compensation that could compromise independence or objectivity 旅行, 豪华餐饮等

Guidance

- 1) Modest gifts okay 尽管如此, 但大部分也要拒绝
- 2) Distinguish between gifts from clients and gifts from entities trying to influence a member's behavior
- 3) **May accept gift from clients-disclose to employer-get permission if gift is for future. When possible, prior to accepting "bonuses" or gifts from clients, members should disclose to employers such benefits offered by clients. If notification is not possible prior to acceptance, members must disclose to employers benefits previously accepted from clients.**
- 4) Members responsible for hiring outside managers should not accept travel, gifts, or entertainment that could impair their objectivity

- 5) Investment banking relationships-do not bow to pressure to issue favorable research 投行部门压力
- 6) For issuer-paid research, **flat fee structure is preferred; must disclose**
- 7) Members working for credit rating firms should avoid influence by issuing firms
- 8) Users of credit ratings should be aware of this potential conflict
- 9) Best practice is for analysts to pay for their own commercial travel to firms being analyzed or to firm events

Recommended Procedures

- 1) Protect integrity of opinions - reports should reflect unbiased opinion
- 2) **Create a restricted list**
- 3) Restrict special cost arrangements
- 4) Limit gifts; **clear value limits by firm** (最多能够接受多少钱的礼物)
- 5) Be careful with IPO share allocations

C. Misrepresentation

Do not make misrepresentations relating to investment analysis, recommendations, actions, or other professional activities. A misrepresentation is any untrue or omission of a fact or any statement that is otherwise false or misleading.

Guidance

- 1) Standard covers oral, written, or electronic communications
- 2) Do not misrepresent qualifications, services of self or firm, or performance record, characteristics of an investment
- 3) **Do not guarantee a certain return**
- 4) **No plagiarism-written, oral, or electronic communications**

Recommended Procedures

- 1) Firms can assist employees by providing written list of the firm's available services and a description of the firm's qualifications
- 2) **Maintain records of materials used to prepare research reports, and quote source, except for "recognized financial and statistical reporting services".** 比如Bloomberg或者很知名的官网, 比如US treasury Website.
- 3) **Models and analysis of others at the firm may be used without attribution**可以随便引用公司同事的分析; **but the report**

written by another analysts employed by the firms cannot be used as another analyst's work.

- 4) Should encourage firm to establish procedures for verifying marketing claims of third parties recommended to clients

D. Misconduct (Mummy's rule)

Do not engage in any **professional** conduct involving dishonesty, fraud, deceit, or commit any act that reflects adversely on professional reputation, integrity, or competence. Fail to act when required by one's professional obligations, such as neglecting to perform due diligence related to investment recommendations, violates Misconduct.

Guidance

This Standard covers conduct that may not be illegal, but could adversely affect a member's ability to perform duties

Recommended Procedures

- 1) Adopt a code of ethics to which every employee must adhere
- 2) Disseminate a list of potential violations and associated disciplinary sanctions
- 3) **Conduct background checks on potential employees** -- look for good character and eligibility to work in the investment industry

Standard II : Integrity of Capital Markets

A. Material Nonpublic Information

Members in possession of nonpublic information that could affect an investment's value must not act **or cause someone else to act** on the information

Guidance

- 1) "Material"—if disclosure of information would affect a security's price or if an investor would want to know before making an investment decision
- 2) If price effect is ambiguous, information may not be considered material
- 3) Extends to info such as **upcoming rating change, influential analysis to be released**

- 4) Information is nonpublic until it has been made available to the marketplace. 比如 CFO告诉你的信息就属于material nonpublic.
- 5) Information made available to analysts in the conference call is considered nonpublic until it is made available to investors in general
- 6) "Act" includes related swaps and options, mutual funds with the security
- 7) If you possess material non-public information, **act as you would if you did not know** 提干中的"rumor"即可能涉及到mosaic theory
- 8) Mosaic Theory—no violation when an analyst combines **non-material non-public** information with public information to reach conclusion

Recommended Procedures

- 1) Information barrier or "**firewall**" is recommended to control interdepartmental communications
- 2) Information barrier includes **use of restricted list**
- 3) Review employee trades
- 4) **Increase review/restrict proprietary trading** while firm is in possession of material nonpublic information

B. Market Manipulation

Do not engage in practices that distort prices or artificially inflate trading volume with intent to mislead market participants

Guidance

- 1) Do not engage in transaction-based manipulation-give false impression of activity/price movement; gain dominant position in an asset to manipulate price of the asset or a related derivative
- 2) Do not distribute false, misleading information

Standard III : Duties to Clients

A. Loyalty, Prudence, and Care 忠诚, 审慎, 尽心尽职

- 1) Duty of loyalty to clients-act with reasonable care and exercise prudent judgment
- 2) **Act for benefit of clients and place their interests before employers or own interests**

3) Determine and comply with any applicable fiduciary duty

Guidance

- 1) Take investment actions in client's best interests 执行对客户有利的投资决定
- 2) Exercise prudence, care, skill, and diligence that a person familiar with such matters would use
- 3) Follow applicable fiduciary duty
- 4) "Client" may be investing public
- 5) Manage pools of client assets according to terms of governing documents
- 6) **Make investment decisions in context of total portfolio**
- 7) **Vote proxies responsibly and disclose proxy voting policies to clients**
- 8) **"Soft dollars" must benefit client** (brokerage fee is client's money, broker will give something back, which is called "soft dollars")

Recommended Procedures

- 1) Follow rules and laws
- 2) Establish client investment objectives
- 3) Diversify
- 4) Deal fairly with clients-investment actions
- 5) **Disclose all possible conflicts**
- 6) **Vote proxies in best interest of clients and ultimate beneficiaries**
- 7) **Keep client information confidential**
- 8) **Seek best trading execution for clients**
- 9) **Place client interests first**

B. Fair Dealing

Deal fairly and objectively with all clients when:

- Providing investment analysis
- Making investment recommendations
- Taking investment action
- Engaging in other professional activities

Guidance

- 1) No discrimination against any clients when disseminating investment recommendations or taking investment action
- 2) **Fair does not mean equal**
- 3) **Different levels of service are okay as long as disclosed and do not disadvantage any clients**
- 4) Investment recommendations:

All clients must have fair chance to act on every recommendation

If client is unaware of recommendation change, **advise before accepting trade order**

5) Investment actions:

Treat all clients fairly--consider investment objectives and circumstances
Disclose written allocation procedures
Do not disadvantage any clients when distributing "hot" issues
> 不管new or old账户, 一视同仁

Recommended Procedures

- 1) Limit number of people aware of upcoming changes
- 2) Shorten time frame-decision to dissemination
- 3) Have pre-dissemination guidelines
- 4) Simultaneous dissemination
- 5) Maintain list of clients and their holdings
- 6) **Disclose trade allocation procedures**
- 7) Review accounts regularly to ensure fair client treatment
- 8) **If firm offers different levels of service, disclose this fact to all clients**
- 9) **Deviations from strict pro rata allocation of IPO are sometimes okay (e.g., minimum block sizes)**

Include allocating pro rata on the basis of order size, not account size. All clients participating in the block trade should receive the same execution price and be charged the same commission.

当自己 buy / sell 和团队意见不一致, 不能 selective disclosure 自己的意见

C. Suitability

When in advisory relationship with a client:

- 1) Make reasonable inquiry as to client's investment experience, risk/return objectives, financial constraints prior to making any recommendation, or taking investment action
- 2) **Update information regularly**
- 3) Ensure investment is suitable to client's situation and consistent with written objectives before recommending an investment or taking investment action
- 4) **Look at suitability in a portfolio context**
- 5) When responsible for managing a portfolio to a specific mandate, strategy, or style, only make recommendations or

take investment actions that are consistent with the stated objectives and constraints of the portfolio

Guidance

- 1) When in advisory relationship, gather client information at the outset and prepare IPS (investment policy statement)
- 2) Update IPS at least annually**
- 3) Consider whether leverage (derivatives) is suitable for client
- 4) If managing a fund to an index or other mandate, invest according to mandate

Recommended Procedures

- 1) When formulating IPS for client, know the client's:
Return objectives
Risk tolerance
- 2) Determine the client's constraints:
Liquidity needs
Expected cash flows, investable funds
Time horizon, tax considerations
Regulatory/legal constraints
Unique circumstances/needs

D. Performance Presentation

- 1) When communicating investment performance information, make reasonable efforts to ensure that it is **fair, accurate, and complete**
- 2) Can make brief presentation, note limited nature, and make detailed information available on request**
- 3) Do not require compliance with GIPS, auditing or verification requirements.

Guidance

- 1) Do not misstate performance or mislead clients about investment performance
- 2) Do not misrepresent past performance
- 3) Provide fair and complete performance information
- 4) Do not state or imply ability to achieve returns similar to those achieved in the past

Recommended Procedures

- 1) Consider audience sophistication when presenting performance

- 2) Use performance of the weighted composite of similar portfolios
- 3) Include terminated accounts as part of historical performance
- 4) **Make all disclosures and maintain records. 如果监管没有说的话, 建议保存至少7年的记录.至于GIPS, 至少5年, 然后补至10年.**

E. Preservation of Confidentiality

Keep current and prospective client information confidential, unless:

- Illegal activities are suspected
- Disclosure is required by law
- Client or prospect allows disclosure of the information

Guidance

- 1) In some cases it may be required by law to report activities to relevant authorities
- 2) This standard **extends to former clients**
- 3) **Exception: May provide confidential information to CFA Institute for an investigation under Professional Conduct program**
- 4) *If applicable law requires members to maintain confidentiality, even if the information concerns illegal activities on the part of the client, members should not disclose such information.*

Recommended Procedures

- 1) Avoid discussing any information received from a client **except to colleagues working on the same project**
- 2) Follow firm's electronic data storage procedures; recommend adoption of procedures if none exist

Standard IV : Duties to Employers

A. Loyalty

On matters related to employment, act for benefit of employer and do not deprive (剥夺) employer of the advantage of skills/abilities, divulge (泄露) confidential information, or otherwise cause harm to employer

Guidance

- 1) Place client interests first but consider effects on firm integrity and sustainability

- 2) Members are encouraged to give employer a copy of the Code and standards
- 3) No incentive or compensation structure that encourages unethical behavior
- 4) Loyalty-Independent Practice:
 - 4.1) If planning to engage in independent practice, **notify employer of services provided, expected duration, and compensation.** 外界有工作的话可以做,前提是征得现在老板的同意.
 - 4.2) Do not proceed without consent from employer**
 - 4.3) Undertaking independent practice means engaging in competitive **business (bad)**, as opposed to **making preparations to begin such practice (ok)**.
- 5) Loyalty-Leaving an Employer:
 - 5.1) Act in best interest of employer until resignation is effective.
 - 5.2) Employer records on any medium (e.g. , cell phone, PDA, home computer) are property of the firm
 - 5.3) Simple knowledge of names of former clients is okay; **don't solicit prior to leaving**
 - 5.4) No prohibition on use of experience or knowledge gained at former employer
 - 5.5) A departing employee is generally free to make preparations to go into the competitive business before terminating their job as long as such preparations do not breach the employee's duty of loyalty. 但是 找下家的时候,不能以带来新客户为条件. 辞职后也必须告诉客户自己辞职了.
 - 5.6) The member **must not take records or files** to a new employer without the written permission of the previous employer.
- 6) Loyalty-Whistleblowing (揭发):
 - 6.1) Permitted only if it protects client or integrity of capital markets 为了保护投资者利益告发了公司, 也属于违反
 - 6.2) Not permitted for personal gain

Members and candidates are required to disclose any compensation arrangement to their employers that involves performing tasks or services that their employers can charge for. Disclosure is required even if the activities occur during non-work hours.

B. Additional Compensation Arrangements (更多针对雇主, 另外的薪资安排)

Do not accept gifts, benefits, compensation, or consideration that competes with, or creates a conflict of interest with, employer's interest unless **written consent** (必须得到同意) is obtained from all parties involved.

Guidance

- 1) Compensation and benefits covers direct compensation by the client and other benefits received from third parties
- 2) For written consent from "all parties involved", email is acceptable

Recommended Procedures

- 1) Written report to employer with details of proposed compensation in addition to normal compensation and benefits
- 2) Details of incentives verified by offering party
- 3) **Include nature of compensation, amount, and duration of agreement**

C. Responsibilities of Supervisors

Make **reasonable** efforts to **detect and prevent** violations of applicable laws, rules, regulations, and Code and Standards by anyone subject to your supervision or authority.

A supervisor's responsibilities relate to detecting and preventing violations by anyone subject to their supervision or authority regarding activities they supervise. Jack had no way of detecting and/or preventing Tom from cheating during the CFA exam, if in fact that is what he did, because it was an event he did not attend.

比如他发现公司合规有问题,那么should decline supervisor responsibilities until adequate procedures to detect and prevent violations of laws. 不用辞职.

Guidance

- 1) Supervisors must take steps to prevent employees from violating laws, rules, regulations, or the Code and Standards
- 2) Supervisors must **make reasonable efforts to detect violations**
- 3) Should enforce **non-investment rules** as well (e.g. , **mandatory vacations**)

Recommended Procedures

- 1) Adequate compliance procedures should:
 - 1.1) Clear and understandable
 - 1.2) Designate a compliance officer
 - 1.3) Have checks/balances; permitted conduct
 - 1.4) Have procedures for reporting violations
- 2) Supervisor and compliance officer should:

- 2.1) Distribute procedures to **appropriate** personnel and update periodically
 - 2.2) **Continually** educate staff
 - 2.3) Review employee actions
 - 2.4) Promptly initiate procedures once a violation has occurred
- 3) Once a violation has occurred, a supervisor should:
- 3.1) Respond promptly
 - 3.2) Conduct a thorough investigation
 - 3.3) Place appropriate limitations on the wrongdoer until investigation is complete.

Standard V Investment Analysis, recommendations and actions

A. Diligence and Reasonable Basis

- 1) Exercise diligence, independence, and thoroughness in analyzing investments, making investment recommendations, and taking investment action
- 2) Have a reasonable and adequate basis, supported by research, for analysis, recommendation, or action

Members are in compliance with Diligence and Reasonable Basis if they rely on the research of another party who exercised diligence and thoroughness. If someone else's opinion did not agree with the final report, disassociating herfrom the report is one way to handle this difference between the analysts.

Guidance

- 1) Make reasonable efforts to cover all relevant issues when arriving at an investment recommendation
- 2) Level of diligence will depend on product or service offered
- 3) Using secondary or third-party research (可以用, 但自己必须先尽职调查):
 - 3.1) Determine soundness of the research-review assumptions, rigor, timeliness, and independence of analysis
 - 3.2) Encourage firm to adopt policy of periodic review of quality of third-party research regarding assumptions, timeliness, rigor, objectivity, and independence
 - 3.3) Members may repackage and distribute third-party research reports as long as they do not represent themselves as the author of the report.

Recommended Procedures

- 1) Establish policy that research and recommendations should have reasonable and adequate basis
- 2) Review/approve research reports and recommendations prior to external circulation
- 3) Establish due diligence procedures for judging if recommendation has met reasonable and adequate basis criteria
- 4) Develop measurable criteria for assessing quality of research
- 5) **Consider scenarios outside recent experience to assess downside risk of quantitative models**
- 6) Make sure firm has procedures to evaluate external advisers they use or promote, including how often to review
- 7) Written procedures of acceptable scenario testing, range of scenarios, cash flow sensitivity to assumptions and inputs
- 8) Procedure for evaluating outside information providers including how often
- 9) **No need to dissociate from group research that the member disagrees with**

B. Communication with Clients and Prospective Clients

- 1) Disclose basic format/general principles of investment processes used to analyze investments, select securities, and construct portfolios
- 2) **Promptly disclose any changes that may affect those processes materially**
- 3) Use reasonable judgment in identifying which factors are important to investment analyses, recommendations, or actions
- 4) Include those factors in communications with clients/prospective clients
- 5) **Distinguish between fact and opinion** in presentation of investment analysis and investment recommendations
- 6) Clearly communicate potential gains and losses on an investment

Guidance

- 1) Include basic characteristics of the security
- 2) Inform clients of any change in investment processes
- 3) **Suitability of investment-portfolio context**
- 4) All communication covered, not just reports

Recommended Procedures

- 1) The inclusion or exclusion of information depends on a case-by-case review
- 2) Maintain records

C. Record Retention

- 1) Develop and maintain appropriate records to support investment analyses, recommendations, actions, and other investment-related communications with clients and prospective clients

Guidance

- 1) Maintain records to support research, and the rationale for conclusions and actions
- 2) **Records are firm's property and cannot be taken** when member leaves without firm's consent
- 3) If no regulatory requirement, CFA Institute recommends retention period of 7 years

Recommended Procedures

- 1) Responsibility to maintain records generally falls with the firm
- 2) However, individuals must retain documents that support investment-related communications
- 3) When member changes firm, they must recreate records from public sources and new firm's information (can't rely on memory or materials from old firm)

Standard VI : Conflicts of Interest

A. Disclosure of Conflicts

- 1) Make full, fair disclosure of **all matters that** could reasonably be expected to impair independence/objectivity, or interfere with duties to clients, prospects, or employer
- 2) Ensure disclosures are prominent, delivered in plain language

Guidance

- 1) Disclose to clients:
 - 1.1) All matters that could impair objectivity-allow clients to judge motives, biases
 - 1.2) For example, between member or firm and issuer, investment banking

relations, broker/dealer market-making activities,
significant stock
ownership, board service

2) Disclose to employers:

2.1) Conflicts of interest-ownership of stock
analyzed/recommended, board

participation, financial and other pressures that may
influence decisions

2.2) Covers conflicts that could be damaging to employer's
business

*Disclose to the employer any outside development because
this activity could possibly interfere with her responsibilities at
current employer. In setting up a new firm, she was not acting
for the benefit of her employer. She should have informed the
current employer she wanted to organize the hedge fund and
come to some mutual agreement on how this process would
occur. 公司本职以外的业务, 需要disclosure of conflicts.*

Recommended Procedures

- 1) Disclose compensation arrangements with employer that
conflict with clients' interests
- 2) If firm does not permit disclosure, consider dissociating from the
activity
- 3) Firms are encouraged to include compensation
information in promotional materials

B. Priority of Transactions

- 1) Investment transactions for clients and employers must
have priority over transactions in which a member or
candidate is the beneficial owner
- 2) **Do not use knowledge of pending trades for personal gain**
注意自己交易是没问题的, 只要不把客户置于不利地位. 公司说Sell 自己buy也
没问题.

Guidance

- 1) "Beneficial owner"—has direct/indirect personal interest in the
securities
- 2) **Client, employer transactions take priority over personal
transactions (including beneficial ownership)**
- 3) Family member accounts that are client accounts must be
treated as other client accounts (you cannot take advantage
or disadvantage of them)

Recommended Procedures

- 1) Firm's compliance procedures should:
 - 1.1) Limit participation in equity IPOs
 - 1.2) Restrict purchase of securities through private Placements
- 2) **Establish** blackout/restricted **periods** (to prevent the investment manager from front running).
- 3) Establish reporting procedures and **prior clearance requirements**
- 4) Disclose policies on personal investing to clients, upon request

C. Referral Fees

Disclose to employer, clients, and prospective clients, as appropriate, any compensation, consideration, benefit received from, or paid to, others for the recommendation of products or services.

Guidance

- 1) Disclosure allows clients and employers to evaluate full cost of service and any potential biases **两个公司之间互相介绍生意没问题, 只要disclose to clients whom he refers就可以了, 没必要disclose to all clients.**
- 2) Disclosure is to be made *prior to* entering into any formal agreement for services
- 3) Disclose the nature of the consideration
- 4) Encourage firm to have clear policy regarding referral compensation
- 5) Firms that do not prohibit should have clear approval process
- 6) Members should **update referral compensation disclosure to employer at least quarterly**

Standard VII : Responsibilities as CFA Institute

Member or Candidate

A. Conduct as Members and Candidates in CFA Program

Do not engage in any conduct that compromises the reputation and integrity of CFA Institute or CFA designation, or the integrity, validity, or security of the CFA examinations.

Guidance

- 1) Conduct includes:
 - 1.1) Cheating on the exam 考试作弊
 - 1.2) Disregarding rules and policies or security measures related to exam administration
 - 1.3) Giving confidential information to candidates or public
 - 1.4) Improper use of CFA designation to obtain personal and professional objectives
 - 1.5) Misrepresenting the CFA Institute Professional Development program or the Professional Conduct Statement
 - 1.6) Don't disclose:
 - 1.6.1) Formulas tested or not tested on exam 公式
 - 1.6.2) Specific question information
 - 1.6.3) Topic emphasis on the exam or topics tested 题型

B. Reference to CFA Institute, the CFA Designation, and the CFA Program

When referring to CFA Institute, membership, designation, or candidacy, do not misrepresent or exaggerate the meaning or implications of membership in CFA Institute, holding the CFA designation, or candidacy in the CFA program.

Guidance

- 1) CFA Institute membership:
 - 1.1) Complete PCS annually
 - 1.2) Pay membership dues annually
- 2) Failure to comply with above results in an **inactive** member status
- 3) Using the CFA designation:

Use the marks "Chartered Financial Analyst" or "CFA" in a manner that does not misrepresent or exaggerate the meaning or implications of holding the CFA designation
- 4) Reference to the CFA program:
 - 4.1) Candidates may reference participation in CFA program, but do not imply achievement of any type of partial designation
 - 4.2) Okay to say "passed all levels on first attempt" but **do not imply superior ability**
- 5) Improper use of the CFA marks:

The "Chartered Financial Analyst" and "CFA" marks must always be used either after a charter holder's name or **as adjectives, not as nouns**

Recommended Procedures

- 1) Make sure that your employer is aware of the proper references to the CFA designation and CFA candidacy.

Module 4 Introduction to the GIPS

Why were the GIPS created?

Misleading practices included:

- 1) *Representative accounts*
- 2) *Survivorship bias*
- 3) *Varying time periods*

Who can claim compliance? (自愿地)

Compliance is a firm-wide process that cannot be achieved on a single product or composite. 要么完全 compliant 要么绝口不提。

Who benefits from compliance?

Investment management firms and prospective clients

Composites: Construction and Purpose

A composite must include all actual, fee-paying, discretionary portfolios managed in accordance with the same investment mandate, objective, or strategy. (包括 terminated portfolios)

- 1) Composite-grouping of individual discretionary portfolios with same investment strategy, objective, or mandate
- 2) A composite must include all portfolios (current and past) that the firm has managed in accordance with this particular strategy
- 3) Groupings must be pre-identified

Purpose of Verification

- 1) **Voluntarily (自愿的)**, a firm may hire an independent third party to verify its claim of GIPS compliance.
- 2) Primary purpose of verification is to provide assurance that compliance with GIPS is on a firm-wide basis
- 3) Requirements:
 - 3.1) Must be performed by a third party, on a firm-wide basis (SEC 不行)
 - 3.2) Verifier must attest that firm has complied with GIPS requirements for composite construction, and firm's processes/procedures are established to present performance in accordance with proper calculation methods, data, and format

GIPS Objectives:

- 1) *Obtain global acceptance of calculation and presentation standards-fair, comparable format with full disclosure*
- 2) *Ensure consistent, accurate performance data -- reporting, marketing and presentations*
- 3) *Promote fair competition*
- 4) *Promote global industry "self-regulation"*

GIPS Key Characteristics:

- 1) To claim compliance, define firm---"distinct" business entity
- 2) GIPS-ethical standards for performance presentation-ensure fair representation
- 3) *Include all actual fee-paying, discretionary portfolios in composites for 5-year minimum, or since inception (add performance results up to 10 years)*
- 4) Certain calculation/presentation standards are required, along with disclosures
- 5) Input data must be accurate
- 6) GIPS-required and recommended provisions (encouraged)
- 7) No partial compliance allowed
- 8) If GIPS conflicts with local law follow local law, but disclose conflict

GIPS Firm's Fundamental Responsibilities:

- 1) Provide compliant presentation to all prospects
- 2) Provide composite list/description to all prospects that make a request
- 3) On client request, provide compliant presentation and composite description
- 4) Joint marketing, separate non-compliant firm

Firm Definition and *Historical Record*

- 1) To claim compliance, firm defined as the "distinct business entity" held out to clients *and does not include fund sponsors or consultants.*
- 2) *Include all actual fee-paying and non-fee-paying, discretionary and non-discretionary portfolios in composites for a minimum of five years or since firm or composite inception (firm wide)*
- 3) Must add one year of compliant performance history each year until a 10-year record is presented
- 4) A reorganization of a firm does not permit any alteration of historical composite results.

Nine Major Sections of GIPS (记住九个名词就行了)

- 0) Fundamentals of compliance -- issues for firms to consider when claiming GIPS compliance, including definition of firm
 - 1) Input data -- must be consistent, for full, fair, comparable performance presentations
 - 2) Calculation methodology -- certain methodologies are required; be uniform in Methods
 - 3) Composite construction -- create meaningful, asset-weighted composites
 - 4) Disclosures -- certain info must be disclosed about presentation/policies
 - 5) Presentation and reporting -- present investment performance according to GIPS requirements
 - 6) Real estate -- provisions also apply to real estate investments, regardless of level of control the firm has over management of the investment
 - 7) Private equity -- value according to GIPS Private Equity Valuation Principles, unless open-end or evergreen fund (then follow regular GIPS)
- 8 Wrap Fee/Separately Managed Account (SMA) Portfolios -- a supplement to Sections 0-5 with specific reference to those provisions which don't apply to Wrap Fee/SMA portfolios and some provisions here that supersede those in Sections 0-5
GIPS 不要求
 - 1) Tracking error for a composite
 - 2) Cumulative returns for both composite and benchmark
 - 3) equal-weighted means and median returns

最后祝各位同学备考顺利！考试加油！

全文完