
DreambigCareer
DBC独家整理
2019 CFA一级
重要知识点总结
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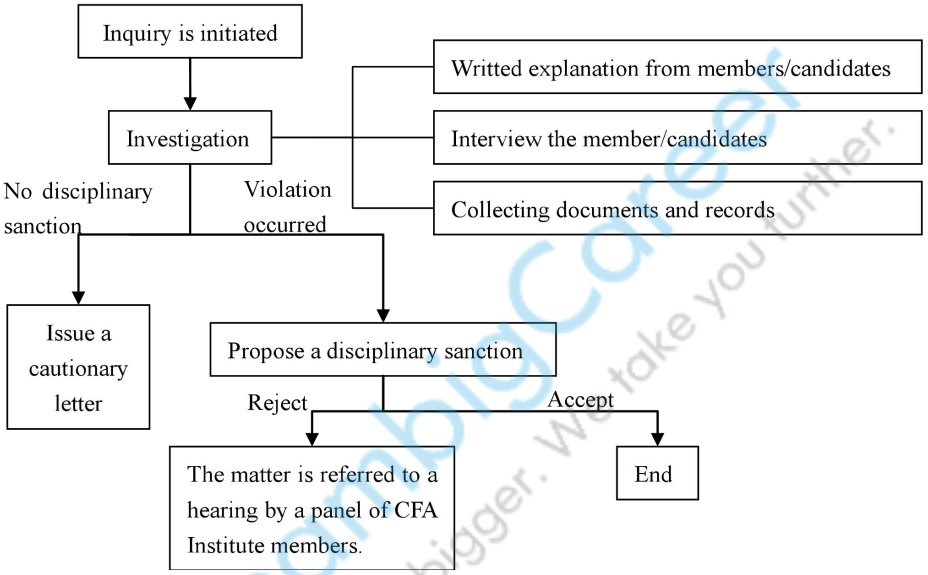
1.1 The process for the enforcement of the Code and Standards

The process for the enforcement of the Code and Standards:



1.2 Primary Principles:

- (1) Fairness of the process to members and candidates
- (2) Confidentiality of the proceedings.

1.3 Disciplinary Review Committee has overall responsibility for the Professional Conduct program and enforcement of the code and standards.

1.4 How to detect

- Self-disclosure on annual Professional Conduct Statements of involvement in civil litigation or a criminal investigation, or that the member or candidate is the subject of a written complaint.
- Written complaints about professional conduct received by the Professional Conduct staff.
- Evidence of misconduct by a member or candidate that the Professional Conduct staff received through public sources, such as a media article or broadcast.
- A report by a CFA exam proctor of a possible violation during the examination.
- 发现有人违反，经过 CFA 调查后，一般会有三种处理方法：1）不处罚；2）发警告信；3）进行处罚（由轻到重依次为：private censor, public censor, timed suspension）

1.5 Hearing panel

- consists of DRC members and CFA Institute member volunteers affiliated with the DRC

1.6 AMC vs. Code and standards

- The Asset Manager Code of Professional Conduct (AMC), which is designed, in part, to help asset managers comply with the regulations mandating codes of ethics for investment advisers.
- AMC was drafted specifically for firms

- Code and Standards is aimed at individual investment professionals

1.7 Knowledge of law

- 必须了解与工作直接相关(directly governing their work) 的法律和规则，但不需要成为 expert on compliance;
- 总是遵守最严格的，但最低限度要遵守 CFA Institute 准则和标准；
- 如果有传递关系，遵循最后一个生效的 law or regulations；

work (applicable)	live	Comply with
Ms → Live	Ls	Ls < Code → Code
Ls → Live	Ms	Ms > Code → Ms

- Guidance of compliance
  - 如果你感觉(**feel**) 有人违法，你必须 consult for advice, but not exempt from requirements to compliance;
  - 如果你知道(**know**)有人在违法，还可以采取分步骤的方法：向公司里的适当人员汇报（report）；如果汇报后仍没有改进，则你必须与违法行为划清界限（**disassociate**），甚至辞职；同时要进一步咨询以便采取进一步的行动；还可以(may consider to persuade to stop)考虑劝说违法的人终止违法行为；（注：If you were a supervisor, how to do?）
- 当发现有违法行为时，CFA Institute 并不要求你向政府管理机构汇报。汇报与不汇报给监管当局完全取决于你个人的判断。但是，CFA 协会又说：such disclosure may be prudent in certain circumstances； There is no requirement under Standards to report violations to governmental authorities, but this may be advisable in some circumstances and required by law in others.
- 如果一个人新到一家公司工作发现其内部有问题，应该 Quit the job；
- Inaction combined with continuing association with those involved in illegal or unethical conduct may be construed as participation or assistance in the illegal or unethical conduct.
- 进行跨境交易 cross-board 时，要注意 law of origination and distribution, should be understood by those responsible for the supervision，要注意 affiliated firm 是否遵守了法律。
- The formality and complexity of compliance procedures for firms depend on the nature and size of the organization and the nature of its investment operations.

1.8 Independence and Objectivity

- **Basic principle**
  - should evaluate both the actual effect of such solicitations on their independence and whether their objectivity might be perceived to be compromised in the eyes of their clients.
- **Investment banking relationships**
  - Firewall—minimizes resulting conflicts of interest. The situation may be aggravated if the head of the company sits on the bank or investment firm's board and attempts to interfere in investment decision making.
  - Researcher co-working with Investment Banking should disclose and manage conflicts adequately and effectively.
  - It is appropriate to have analysts work with investment bankers in "road show" only when the conflicts are adequately and effectively managed and disclosed.

- **Public companies**
  - Analysts should not be pressured to issue favorable research by the companies they follow.
  - Don't confine research to discussions with company management, but rather use a variety of sources, including suppliers, customers, and competitions.
  - 研究报告只卖给单一客户 may violate I (B): Independence and Objectivity.
  - 研究费最好是 flat fee， cannot be directly linked to the conclusion or recommendation.
- **Buy-Side clients**
  - Sell-side analyst should not be pressured by buy-side firms to issue favorable research on current or prospective investment-banking clients.
  - Analysts must engage in thorough, independent, and unbiased analysis and must fully disclose potential conflicts, including the nature of their compensation.
- **Gift from client & Gift from the third party**
  - Reject gift that could be expected to compromise their own or another's independence and objectivity（best practice). Modest gift is OK, but as long as its purpose is not to compromise the objectivity.
  - 判断的原则：第一是礼物的金额很少（modest)；第二是礼物不能是单独为你准备的(arrangement not unusual)
  - Gift from client 可以接受, but should disclose to employer and obtain consent from all parties involved (IV(C)); if not disclose, violate I(B) and IV(C).
- **Fund manager relationships**
  - Members and candidates who are responsible for hiring and retaining outside managers should not accepts gifts, entertainment, or travel funding that may be perceived as impairing their decisions.
  - For meeting sponsored by funds, members and candidates must review the merits of each offer individually in determining whether they may attend yet maintain their independence of conduct regarding the analytic process and the distribution of their reports.
- **The rating agencies**
  - Need to develop the necessary firewalls and protections to allow the independent operations of their different business lines.
  - abide by their agencies' and the industry's standards of conduct regarding the analytical process and the distribution of their reports
  - When using information provided by credit rating agencies, members and candidates should be mindful of the potential conflicts of interest.
- **Travel Funding**
  - Members and candidates may be influenced by these discussions when flying on a corporate or chartered jet.
  - Best practice dictates that members and candidates always use commercial transportation rather than accept paid travel arrangements from an outside company.
  - Should commercial transportation be unavailable, members and candidates may accept modestly arranged travel to participate in appropriate

information-gathering events, such as a property tour.

- **Procedures for compliance**
  - Protect the integrity of opinions: unbiased, design compensation systems with integrity
  - Create a restricted list: if unwilling to issue unfavorable, put it on a restricted list and only issue factual information
  - Restrict special cost arrangement: pay charges by themselves when visiting headquarter, not reimbursed for air fees by corporate issuer, limit use firm's aircraft only when no commercial transportation, frequently meeting with corporate issuer 接触会是不好的，会给外人一个想法，觉得影响到主观性和独立性. Should not always be hosted by issuer.
  - Limit gifts: Customary, business-related entertainment is okay as long as its purpose is not to influence a member's professional independence or objectivity; based on local custom and whether the limit is per gift or annual total amount.
  - Restrict investments: encourage firms to develop formal policies about employee purchases of equity or equity-related IPOs, require prior approval for employee to participate in IPOs, disclose timely investment actions following the offering, strict limit on private placements.
  - Review procedures: implement effective supervisory and review procedures about personal investment activities
  - Independence policy: formal written policy, not influenced by any parties that could comprise their independence.
  - Appointed officer: to supervise for compliance; provide procedures and policies for reporting violation to every employee.

1.9 Misrepresentation

- 下面的形式都与 **Misrepresentation** 相关
  - Oral representations, advertising, electronic communications, or written materials. （written materials include research reports, market letters, newspaper columns, and books; electronic communications includes internet communications, web pages, chat room, and e-mail）
  - 将“明知故犯”（knowingly）界定为知道或者应该知道。“knowingly” means that the member or candidate either knows or should have known that the misrepresentation was being made or that omitted information could alter the investment decision-making process.
- **Guarantee the investment performance:**
  - I(C) prohibit members and candidates from guaranteeing clients specific return which is inherently volatile.
  - But I(C) does not prohibit from guaranteeing the return which is built into the structure of the product itself or for which an institution has agreed to cover any losses. 如,联邦储蓄利率是 2%，那么保证 2%利率是可以的
  - Misrepresentation 包括保证收益率 which is inherently volatile，Misrepresentation of service and qualification, plagiarism
- **Misrepresentation of service and qualification**
  - 不可以对客户说“我们可以提供你需要的所有服务”，正确的做法是提供一个

公司所能提供的服务清单；

- 对于发行人付费的研究报告，分析师必须披露被雇做研究这个事实，如果隐瞒这个事实，就违反了 I(C)；
- List the qualification of individual and firm.

➢ **Plagiarism**

- Use excerpts from others either verbatim or with only slight changes in wording, no specific quotations with "leading experts", present statistical estimates of forecasts prepared by others and identify the source without caveats, charts and graphs without stating their source, copying proprietary computerized spreadsheets or algorithms without seeking cooperation or authorization of their creators；
- 引用别人的思想需要鸣谢(credit or acknowledgement)，否则就是 Plagiarism；
- 引用他人的模型，分析师作了少许修改，把模型作为自己的，属于 plagiarism 行为，违反了 I(C)，正确的做法是鸣谢这个模型的出处来源；
- 引用媒体的转载，best practice cite author or to use the information provided in media and cite the two；
- 无心的打字错误不违反 misrepresentation，但是如果发现错误，却没有纠正，那么就违反了 misrepresentation
- 自己在业余时间开发的模型属于自己所有，可以使用；

➢ The firm retains the right to continue using the work completed after a member or candidate has left the organization. Members cannot, however, reissue a previously released report solely under his or her name.

➢ **Procedures**

- Verify outside information: verify for the third may impact its integrity. Encourage to develop policy to verify.
- Maintain webpage: current information; protect site's integrity, confidentiality, and security; not misrepresent and fully disclose.
- Plagiarism policy: maintain copies of all research reports with research ideas, material with new methodologies, and other materials being relied on in preparing the research report; attribute quotations, including projections, tables ,statistics, model/product ideas, and new methodologies prepared by persons other than recognized financial and statistical reporting service or similar service; attribute summaries or paraphrase.

1.10 Misconduct

➢ **Scope of application**

- 凡是有关于欺诈的(lying, cheating, stealing and other dishonest activities)都是 misconduct；所有作弊行为都是 misconduct.
- 但是职业无关的除欺诈以外的行为是不违反 misconduct 的，比如作为某一环保组织成员进行游行，Do not abuse this standard to settle personal, political, or other disputes unrelated to professional ethics.

➢ Excessive drinking at lunch during work making negative effect on your ability to make sound investment decisions is a violation of Standard I(D).

➢ 成员和考生不能使用 photocopy，不要将拷贝资料带到考场！

➢ 个人破产是否需要 disclose？

- 如果是经营破产（如与欺诈无关），不算；
- 如果是因欺诈引起的高额罚金而导致的破产，算。
- 如果是自己的妻子在经营公司的时候由于欺诈原因破产，不算。

➢ Recommended procedures
- Code of ethics: every employee should subscribe and make clear that the un-ethical activities will not be tolerated.
- List of violations: potential violations and associated disciplinary sanctions.
- Employee references: good character and eligible for work.

1.11 Material nonpublic information

➢ 判断 material 的条件（竞争对手的预测不能认为是 MNI）: reliable and unambiguous，对股价有影响的 information 是 material 的，

➢ 比如：Substance and materiality
- Earnings
- M&A, acquisitions, tender offers, or joint ventures
- Changes in assets, Changes in management
- Innovative products, processes, or discoveries
- New licenses, patents, registered trademarks, or regulatory approval/rejection of a product
- Developments regarding customers or suppliers (e.g., the acquisition or loss of a contract)
- Changes in auditor notification or the fact that the issuer may no longer rely on an auditor's report or qualified opinion
- Events regarding the issuer's securities (e.g., defaults on senior securities, calls of securities for redemption, repurchase plans, stock splits, changes in dividends, changes to the rights of security holders, public or private sales of additional securities, and changes in credit ratings)
- Bankruptcies
- Significant legal disputes
- Government reports of economic trends (employment, housing starts, currency information, etc.)
- Orders for large trades before they are executed

➢ Material 的其他情形：
- 有名的公司或者分析师对股价的研究对市场有影响，算是 material。If not a client, she/he can obtain early access to the MNI prior to publication, however, can't use MNI for trading.
- 在职过程中所获取的信息，自己不能使用也不能促使他人使用，misappropriation。
- suppliers：从供应商处了解到一个公司的信息，如果来源是可靠的，则算是 MNI，不能使用；如果是自己观察到的，属于 Mosaic 理论，可以使用。竞争者的分析，不算 material。
- 不管通过什么途径，公开发行的报告就是 public（失误引起的提前发行，算不算做公开发布？算, can use for trading）
- 如果公司在分析师会议上内幕信息，怎么办？Can't use.
- 一个原来是 researcher，现在调到投行部门工作，不能分享部门的信息

- Mosaic Theory：使用 material public information and non-material non-public information.
- Selective disclosure may violate MNI. Analysts must be aware that a disclosure made to a room full of analysts does not necessarily make the disclosed information "public." Analysts should also be alert to the possibility that they are selectively receiving material nonpublic information when a company provides them with guidance or interpretation of such publicly available information as financial statements or regulatory filings.
- 如果公司拥有 MNI
  - 对于自营交易，分为两种情况：
  - 如果做 market maker，firms that continue market-maker activity should instruct their market makers to remain passive to the market-that is, take only the contra side of unsolicited customer trades；
  - In risk arbitrage trading, The most prudent course is to suspend arbitrage activity；If continue arbitrage activity, the firm face a high hurdle in proving the adequacy of their internal procedures and must demonstrate stringent review and documentation of firm trades.
- Watch list shown to solely the few people in compliance department is used to review the transaction of specific securities.
- Even at small firms, procedures concerning interdepartmental communication, the review of trading activity, and the investigation of possible violations should be compiled and formalized.
- **Achieve public dissemination**
  - If material, should try to achieve public dissemination.
  - Encourage the firm to make it public, if not possible, report only to designated supervisory and compliance personnel within her firm.
  - not invest on MNI, or induce insider to disclose MNI
- Adopt compliance procedures**.**
  - Should encourage their firms to adopt compliance procedures to prevent the misuse of MNI.
  - Particularly important is improving compliance in such areas as the review of employee and proprietary trading, documentation of firm procedures, and the supervision of interdepartmental communications in multi-service firms.
  - Compliance procedures should suit the particular characteristics of a firm, including its size and the nature of its business.
- The minimum elements of such **firewall** include, but are not limited to, the following:
  - substantial control of relevant interdepartmental communications, preferably through a clearance area within the firm in either the compliance or legal department;
  - review of employee trading through the maintenance of "watch," "restricted," and "rumor" lists;
  - documentation of the procedures designed to limit the flow of information between departments and of the actions taken to enforce those procedures;
  - heightened review or restriction of proprietary trading while a firm is in

possession of material nonpublic information.

- **Physical separation of departments**
- **Prevention of personnel overlap**
- **A reporting system**
  - authorized people review and approve communications between departments.
  - consult a designated compliance officer to determine whether sharing the information is necessary and how much information should be shared.
  - If the sharing is necessary, the compliance officer should coordinate the process of "looking over the wall"
  - A single supervisor or compliance officer should have the specific authority and responsibility of deciding whether or not information is material and whether it is sufficiently public to be used as the basis for investment decisions.
  - Ideally, the officer is independent.
- **Personal trading limitations.**
  - Firms should consider restrictions or prohibitions on personal trading by employees and should carefully monitor both proprietary trading and personal trading by employees.
  - require employees to make periodic reports (to the extent that such reporting is not already required by securities laws) of their own transactions and transactions made for the benefit of family members.
  - Securities should be placed on a restricted list when a firm has or may have material nonpublic information.
  - a watch list shown to only the few people responsible for compliance should be used to monitor transactions in specified securities.
  - The use of a watch list in combination with a restricted list is an increasingly common means of ensuring effective control of personal trading.
- **Record maintenance.**
  - Multi-service firms should maintain written records of the communications between various departments.
  - Firms should place a high priority on training and should consider instituting comprehensive training programs, particularly for employees in sensitive areas.
- **Communication to all employees.**
  - Written compliance policies and guidelines should be circulated to all employees of a firm.
  - Policies and guidelines should be used in conjunction with training programs aimed at enabling employees to recognize MNI.
  - Such information is not always clearly identifiable. Employees must be given sufficient training to either make an informed decision or to realize they need to consult a supervisor or compliance officer before engaging in questionable transactions.

1.12 Market manipulation

- **The intent of the action is critical to determine whether it is a violation of this standard.**
  需要注意什么时候是违反的，出于什么样的目的是不违反的: (for tax and inefficiency)
  利用市场的非有效赚钱，是否违反？为了税收的目的，是否违反？No!!!

- 以操纵为目的的信息发布（information based)和交易(trading based)都是违反的；
- 如果是为了误导市场从而增加自己或者自己管理的账户的收益就是违反；
- 一家交易所与做市商签署协议，要求做市商保证最低交易量，同时，交易所承诺佣金折让。如果他们的目的旨在操纵市场，则违反了 II(B)；如果他们的目的旨在活跃市场，且此协议对外公布，则不违反 II(B)。

1.13 Loyalty, prudence and care

- The first step is to determine the identity of the "client" to whom the duty of loyalty is owed. For the pension fund, trustee owes fiduciary to beneficiary rather than to sponsor.
  - Loyalty, prudence and care 是讲对 Employer 的忠诚；
  - For the personal assets of an individual, the client is the individual.
  - For the portfolios of pension plans or trusts, the client is the beneficiaries of the plan or trust, not the sponsor. The duty of loyalty is owed to the ultimate beneficiaries. 一个人管理一个企业的养老金，他的最终客户企业员工
  - For managing a fund to an index or an expected mandate owe the duty of loyalty, prudence, and care to invest in a manner consistent with the stated mandate.
- Develop client's portfolios
  - should ensure that the client's objectives and expectations for the performance of the account are realistic and suitable to the client's circumstances and that the risks involved are appropriate.
  - In most circumstances, should relate to the long-term objectives and circumstances of the client.
- **Soft Commission Policies.**
  - "soft dollars" or "soft commissions" should benefit clients, not investment manager.
  - If pay a higher commission without corresponding benefit to the client, violate
  - If not benefit the client, they should disclose to clients the methods or policies followed in addressing the potential conflict. (benefit other clients)
  - "directed brokerage" is OK, but still obligated to seek "best price" and "best execution,", and be assured by the client that the goods or services purchased from the brokerage will benefit the account beneficiaries. In addition, should disclose to the client that the client may not be getting best execution from the directed brokerage.
  - "Best execution" refers to a trading process that seeks to maximize the value of the client's portfolio within the client's stated investment objectives and constraints.如果客户执意要求 directed brokerage，而不考虑利益的最大化，应该取得客户的书面同意
  - 如果 manager 自己受益于 higher commission，是否违反 standard？It depends.
- Regular account information. should submit to each client, at least quarterly, an itemized statement showing:
  - the funds and securities in the custody or possession plus all debits, credits, and transactions that occurred during the period;
  - where the assets are to be maintained, as well as where or when they are moved;
  - should separate the client's assets from any others' and their own assets.

- Client approval.
  - If uncertain, should ask what he/she would expect or demand if the member/candidate was the client.
  - should disclose the questionable matter in writing to the client and obtain client approval.
- Should diversify unless diversification is not consistent with plan guidelines or is contrary to the account objectives
- Vote proxies in the best interest of beneficiaries and clients，并不是任何时候使用 vote proxies 都是有益的，如果**考虑到成本和收益之间关系**的话,可以放弃每次都投票。(Blind voting 是违反的). Should determine who is authorized and for the benefit of beneficiaries, should disclose any change in voting proxy policy.
- Standard III(A), however, is not a substitute for a member's or candidate's legal or regulatory obligations. The duty required in fiduciary relationships exceeds what is acceptable in many other business relationships because a fiduciary is in an enhanced position of trust.

1.14 Fair dealing

- 最重要的两个考点；fair 不等于 equal；如果 equally，有可能违反 fair dealing.
- 可以为不同的客户设置不同的服务等级，但是必须不对顾客造成负面影响。Different clients have different levels of service. 这是可以的，只要满足前提: not disadvantage others, disclose the service and make it available to those who needs
- investment recommendation 的发表可以有多种方式：brief update report, by addition to or deletion from a recommended list, or simply by oral communication，都必须遵循 fair dealing 的准则。
- 投资建议时，disclosure of inequitable allocation system, even accepted by clients, can't be exempt from fair dealing for disclosure and acceptance. Disclose trade allocation procedures 需要注意 disclosure of inequitable allocation methods does not relieve the member of this obligation
- 发现是一个股票是 Hot issue，给自己喜欢的顾客多配了一些，违反了 Fair dealing；
- 把新的投资建议 e-mail 给顾客之后找大机构客户讨论细节，没有违反 fair dealing
- Investment action
  - Should distribute the issues to all customers for whom the investments are appropriate in a manner consistent with the policies of the firm for allocating blocks of stock.
  - If the issue is oversubscribed, the issue should be prorated to all subscribers.
  - This action should be taken on a round-lot basis to avoid odd-lot distributions.
  - If the issue is oversubscribed, members/candidates should forgo any sales to themselves or their immediate families in order to free up additional shares for clients.
  - If the investment professional's family-member accounts are managed similarly to these of other clients of the firm, should not be excluded from buying such shares.
- Procedures
  - communicate recommendations both within the firm and to customers simultaneously.

- Disseminate a short summary report including the conclusion might be published in advance.
- processing and executing orders on a first-in, first-out basis
- giving all client accounts participating in a block trade the same execution price and charging the same commission
- When the full amount of the block order is not executed, allocating partially executed orders among the participating client accounts pro rata on the basis of order size while not going below an established minimum lot size for some securities.
- When allocating trades for new issues, obtaining advance indications of interest, allocating securities by client (rather than portfolio manager), and providing for a method for calculating allocations.
- Establish review procedures to detect whether trading in one account is being used to benefit a favored client

1.15 Suitability

- When advisory, know clients, suitable and under portfolio; when to a specific mandate, consistent with stated objectives and constraints; suitability doesn't prevent from losing value.
- If unsolicited trade is known unsuitable:
  - To individual, should refrain from trade or seek an affirmative statement from the client that suitability is not a consideration.
  - To funds manager managing to index, the duty of suitability is conferred to advisor for clients.
- IPS should be updated at least annually and prior to material changes to any specific investment recommendations or decisions on behalf of the client.
- Suitability analysis conducted by members and candidates can not be expected to be complete but must be done based on the information provided.
- Leverage and limited liquidity, depending on the degree to which they are hedged, bear directly on the issue of suitability for the client.
- The two clients have different circumstances and objectives. Should Not recommend the same.
- Managing to an Index or Mandate
  - responsibility is to invest consistently with the stated mandate, not specific clients
  - The responsibility for determining the suitability of an investment for clients can only be conferred on members and candidates who have an advisory relationship with clients.
- Regular updates.
  - The investor's objectives and constraints should be maintained and reviewed periodically to reflect any changes in the client's circumstances.
  - should regularly compare client constraints with capital market expectations to arrive at an appropriate asset allocation. Changes in either factor may result in a fundamental change in asset allocation.
  - Annual review is reasonable unless business or other reasons, such as a major change in market conditions, dictate more frequent review.

- Members and candidates should document attempts to carry out such a review if circumstances prevent it.

➢ **The suitability test procedures** should require the investment professionals to look beyond the potential return of the investment and include the following:
- an analysis on the impact on the portfolio's diversification,
- a comparison of the investment risks with the client's assessed risk tolerance,
- the fit of the investment with the required investment strategy.

1.16 Performance presentation

➢ Should be accurate, complete and fair;
- 不可以以投资业绩误导客户或潜在客户;
- 不可误陈述过去业绩或合理预期业绩;
- 不可以说明或暗示有能力与过去业绩相同的收益;

➢ If the presentation is brief, the member or candidate must make available to clients and prospects, upon request, the detailed information supporting that communication; that brief presentations include a reference to the limited nature of the information provided.

➢ terminated accounts as part of performance history 违反 performance presentation;

➢ No prohibition of showing past record but it should be fully disclosed where the performance comes from and the person's role in it.

➢ **disclosures** that would fully explain the performance results being reported:
- stating when appropriate, that results are simulated when model results are used
- clearly indicating when the performance record is that of a prior entity,
- or disclosing whether the performance is gross of fees, net of fees, or after tax
- Including the portfolio terminated as part of performance history.
- The performance of weighted rate of return rather than a single performance
- 为了遵守 III（D），最好能够遵循 GIPS 的规定

1.17 Preservation of confidentiality

➢ Confidentiality comes from: 1) member's ability to conduct business on behalf of clients; 2) special or confidential relationship with others.

➢ **Illegal vs disclose**
- Disclosure is required by law, should disclose.
- If applicable law requires to keep confidentiality, even if illegal, should preserve confidentiality;

➢ When in doubt, should consult with their employer's compliance personnel or outside counsel before disclosing confidential information about client;

➢ Preserve confidential information even if the person or entity is no longer a client;

➢ When applicable law permits, members should consider the PCP an extension of themselves when requested to provide information about a client, which will be kept in strict confidence.

➢ The simplest, most conservative, and most effective way to comply with Standard III (E) is to avoid disclosing any information received from a client except to authorized fellow employees who are also working for the client.

➢ In some instances, however, a member/candidate may want to disclose information received from clients outside the scope of the confidential relationship and does not

involve illegal activities. Before making such a disclosure, a member/candidate should ask the following:

- In what context was the information disclosed? If disclosed in a discussion of work being performed for the client, is the information relevant to the work?
- Is the information background material that, if disclosed, will enable the member or candidate to improve service to the client?

1.18 Loyalty to employer

- **Principle to judge** is not to injure the firm, deprive of its profit, or deprive of the employee's advantage of ability and skills
- Independence practice for compensation is allowed if a notification is provided to the employer fully describing all aspects of the activities and if the employer and the 3rd party consents to all terms of the proposed independent practice before it begins.
- 投资分析师，同时担任市长要披露吗？兼职教书可以吗？
- 在职揭发(whistle blowing). 如果为保护客户利益、市场诚信和其他**非个人利益**目标，是可以不将雇主利益放在首位的；In such instances, activities that would normally violate a member's/candidate's duty to his/her employer (such as contradicting employer instructions, violating certain policies and procedures, or preserving a record by copying employer records) may be justified.
- 独立的合同承包商(independent contractors)必须遵守与雇主所达成的协议 (oral or written agreement)；如果没有协议，则没有遵守的问题；
- 在辞职前，雇员不可以做的行为包括但不限于以下所列：
  - 盗用(misappropriation)客户的商业秘密(trade secrets)；
  - 滥用(misuse)保密信息(confidential information)；
  - 辞职前劝诱(solicit)客户转移业务；
  - 盗用(misappropriation)客户资料；
  - Self-dealing (appropriating for one's own property a business opportunity or information belonging to one's employer)
  - 拿走雇主的财产(property of the Employer)。
- 仅仅知道原雇主的客户名字是不属于机密 unless deemed such by contract or law;
- 在雇主那儿学习的工作经验和技能是可以使用的, even if contract exists.（比如和原雇主签订合同说离职之后不能使用这些技能，但是实际是可以用的，因为这个合同本身就存在问题）；但是，在职过程中自己开发的模型不可以带走。
- After leaving can solicit prior employer's clients as long as contact information is not from records of the former employer or violate an applicable non-compete agreement; before leaving, shouldn't solicit the former employer's clients.
- must not engage in any activities that would conflict with this duty until their resignation becomes effective，如果自己成立公司，可以用自己的时间去准备自己的公司。前提：不能与雇主发生竞争，必须预先通知雇主。
- Incident-reporting procedures. Be aware of firm's whistle blowing policies, encourage to adopt industry best practice, many firms are required by regulatory mandates to establish confidential and anonymous reporting procedures

1.19 Additional compensation arrangement

- 礼物包括从顾客或其他第三方收取的直接和间接的好处；
- 所有安排必须得到雇主的同意(No arrangement without the employer's approval)，从

雇主之外收取的其他收益必须立即以书面形式(immediate written report)向雇主说明所收到收益和服务的详细情况 (amount and nature of consideration)；

- 披露的目的在于：雇主有权知道雇员的报酬情况来评估服务的真实成本和对雇员忠诚和客观的影响。
- Members/candidates must obtain permission for additional compensation/benefits because such arrangements may affect loyalty and objectivity and create potential conflicts of interest.

disclose	consent	violate
√	×	IV(B)
√	√	--
×	×	IV(B), VI(A), I(B),

1.20 Responsibility of Supervisor

- By establishing and implementing the written compliance system and ensuring such system is followed through periodic review。
- 在建立制度时，必须明确：What an adequate system is。
- 如果将管理的职责委托给（delegate）他人，管理者不能免除监督管理的职责，且必须 instruct 被委托的人 how to detect and prevent the violations of laws,rules and code。
- 对于不合理(inadequate)的管理制度，管理者应提请上层注意并提出改进(corrective)建议。
- 如果由于不存在（nonexistent）制度或制度不完善(poor)，管理者必须以书面形式拒绝接受管理职责 until the firm adopts adequate system
- 公司有了严格的规章制度，也进行了严格监督，supervisor 不违反这条 standard
- Codes of ethics should be written in plain language and consist of fundamental, principle-based ethical and fiduciary concepts that are applicable to all of the firm's employees, unencumbered by numerous detailed procedures directed to the day-to-day operation of the firm.
- Supervisor should continually educate personnel regarding the compliance procedures
- Enforcement of Non-Investment-Related Policies.
  - A member/candidate with supervisory responsibility should enforce policies related to investment and non-investment-related activities equally.
  - Firms regularly establish policies related to attendance and acceptable workplace actions, such as mandatory vacations for specific positions.
  - The equal enforcement of all firm policies assists in creating a strong ethical work environment where all rules are demonstrated to be important.
- 如果发现有人违反制度，管理者必须：
  - Promptly respond
  - Thoroughly investigate
  - Appropriately limit the actions of wrongdoer or increase monitoring, just warning the wrongdoer, or get promise and explanation, are NOT enough.
- Adequate procedure
  - Be clearly written;
  - Easy to understand;

- Designate a compliance officer;
- Create a system of checks and balances;
- Outline the scope of the procedures;
- Outline permitted conduct;
- Procedure for reporting violations and sanctions.

➢ Once the compliance program is instituted, the supervisor should:

- Distribute it to the proper personnel;
- Update it as needed;
- Continually educate staff regarding procedures;
- Issue remainders as necessary;
- Require professional conduct evaluations;
- Review employee actions to monitor compliance and identify violations;
- Enforce procedures once a violation occurs.

1.21 Diligence and Reasonable basis

➢ 如果是 group 的 report, 只要 opinion has a reasonable and adequate basis,

- 如果同意结论，就不需要从中分离；
- 如果不同意结论， can keep the name on the report, but should document difference of opinion with the team, 或者，如果要求将名字移走， should document the request of removal of the name.

➢ Should check the database in a timely manner and updating her report to the client.

➢ always recommend "hot" issues，违反 V(A)；always buy "hot" issues for all clients，也违反 suitability.

➢ When selecting external managers，standard criteria need to be ensured:

- reviewing the adviser's established code of ethics,
- understanding the adviser's compliance and internal control procedures,
- assessing the quality of the published return information
- reviewing the adviser's adherence to its stated strategy

➢ Test the quality of research

- Have a policy requiring that all research reports be supported by reasonable and adequate basis;
- Have detailed written guidance for proper research and due diligence;
- Have measurable criteria for judging the quality of research.

➢ Members/candidates need to ensure that their firms have standardized criteria for reviewing external information provider.

- measurable criteria for assessing outside providers, including the quality of information being provided, the reasonableness and adequacy of the provider's collection practices, and the accuracy of the information over time.
- should outline how often the provider's products are reviewed.

➢ Quantitatively Oriented Research.

- Including computer generated screening and ranking of equity securities and the creation or valuation of derivative instruments.
- Models are being used for more than the back testing of investment strategies, and the continued development of models is an important part of capital market developments

- Develop detailed, written guidance that establishes minimum levels of scenario testing of all computer-based models used in developing, rating, and evaluating financial instruments. The policy should contain criteria related to the breadth of the scenarios tested, the accuracy of the output over time, and the analysis of cash flow sensitivity to inputs.
- test the models by using volatility and performance expectations that represent scenarios outside the observable databases.

1.22 Communication with Clients and Prospective Clients

- Content: Basic format and general principles, relevant factors, opinion vs. fact.
- 交流有很多方式，包括 in-person recommendation, telephone conversation, media broadcast, or transmission by computer (e.g., on the Internet);
- Brief communications must be supported by background reports or data that can be made available to interested parties on request;
- If recommendations are contained in capsule form (such as a recommended stock list), members/candidates should notify clients that additional information and analyses are available from the producer of the report;
- 在做过充分调查后，report writer 可以 omit 一些不重要得部分，但是 clearly stipulate the limits to the scope of the report. Must disclose the omissions.
- Changes in style, ceilings, committee, universe of investment should disclose to the clients and prospect clients. 如果投资过程发生了改变，如改变了投资方法，用 DDM 改为指数化投资、由个人决策到委员会决策等，都必须向 Clients and prospects 进行披露
- Distinguish between statistical conjecture (opinion) and facts.

1.23 Record Retention

- 必须保留得出投资结论和投资操作的所有研究记录，这些记录是公司的财产；
  - 如果当地没有明确的规定，CFA 协会要求记录必须保留 7 年；
  - If applicable law requires 5-year record, 5-year record retention is OK.
- Records can be maintained either in hard copy or electronic form;
- Without re-creating the records at the new firm, the member/candidate can't use historical recommendations or research reports created at the previous firm;
- Performance of past firm's
  - Cannot use without supporting documentation
  - For future use, the member/candidate must re-create the supporting records at the new firm with information: 1) gathered through public sources; 2) or directly from the covered company and not from memory or sources obtained at the previous employer. (unless with permission of prior employer)

1.24 Disclosure of interest

- Members and candidates mush make full and fair disclosure of all matters that could reasonably be expected to impair their independence and objectivity or interfere with respective duties to their clients. Members and candidates must ensure that such disclosures are prominent, delivered in plain language, and communicate the relevant information effectively.
- Best practice is to avoid conflicts of interest when possible; and when conflicts cannot be reasonably avoided, disclosure of their existence is necessary. 必须披露在董事会

的任职情况，否则违反了 VI(A)；个人持有股票的事实必须对外披露，否则违反了 VI(A)。

- If inadvertently have conflict, disclose to clients, potential clients, and employers all actual and potential conflicts of interest
- Special compensation arrangements, such as bonuses based on short-term performance criteria, commissions, incentive fees, performance fees, and referral fees, are potentially in conflict with client's interests，应作及时地披露；if employers not permit to disclose, should separate from such arrangement, even quitting the job.
- Disclose all matters that reasonably could be expected to impair the member/candidate's objectivity allows clients and prospects to judge motives and possible biases for themselves.
- 如果和雇主之间存在冲突，must report them promptly so that the employer and the member/candidate can resolve them as quickly and effectively as possible.
- If a member or candidate manages a portfolio for which the fee is based on a share of capital gains or capital appreciation (a performance fee), this information should be disclosed to clients.
- If a member/candidate, or a member/candidate's firm has outstanding agent options to buy stock as part of the compensation package for corporate financing activities, the amount and expiration date of these options should be disclosed as a footnote to any research report published by the member or candidate's firm.
- If asked to cover the company, when inherit the shares of the company in subject, can write report but should disclose, OR best to assign another to follow up the company. An exception is that you are the only researcher with exception to Q86-1
- Disclosure of performance arrangement
  - Firms are encouraged to include information on compensation package in firms' promotional literature.
  - If fee based on capital gains or capital appreciation (a performance fee), should disclose;
  - If outstanding agent options exist for the performance incentives, should disclose the amount and expiration date of these options as a footnote to any research report published.

1.25 Referral Fee

- disclosure 的目的在于让客户和雇主评估：1）any partiality shown in any recommendation of services ；2）the full cost of the services;
- Disclose to the clients being referred and employer if necessary;
- must disclose the nature of the consideration or benefits, Consideration includes all fees, whether paid in cash, in soft dollars, or in kind;
- Employers should have investment professionals provide to the clients notification of approved referral fee programs and provide the employer regular (at least quarterly) updates on the amount and nature of compensation received
- Summary: disclosure of referral fee to clients or employers

Situations	Employer	Clients and prospects
Inter-firm referral	√	√
Inter-department referral	×	√

Salesperson promotion	×	×
Funds manager promotion	×	×(best practice √)

1.26 Priority of Transaction

- Clients>employer>individual
- Transactions for clients and employers must have priority over transactions in securities or other investments of which a member or candidate is the beneficial owner so that such personal transactions do not adversely affect the interests of their clients or employers.
- Family accounts
  - Those client accounts should be treated like any other firm account and should neither be given special treatment nor be disadvantaged because of the family relationship.
  - If a member/candidate has a beneficial ownership in the account, however, the member or candidate may be subject to pre-clearance or reporting requirements of the employer or applicable law.
- Although conflicts of interest exist, nothing is inherently unethical about individual managers, advisers, or mutual fund employees making money from personal investments as long as:
  - (1) the client is not disadvantaged by the trade,
  - (2) the investment professional does not benefit personally from trades undertaken for clients,
  - (3) the investment professional complies with applicable regulatory requirements.
- Limited participation in equity IPOs
- Restrictions on private placements
- Disclosure of holdings in which the employee has a beneficial interest.
- 如果 analyst 在发布分析报告后得第 7 天进行交易，是否违反？不违反
- 如果 analyst 在发布分析报告之前进行交易，可能违反 3 条 standard（priority of transaction, material nonpublic information 和 responsibility of supervisor.

1.27 Responsibilities as a CFA Institute Member/Candidate; Reference to CFA institute, designation

- violations include:
  - Cheating on the CFA exam or other CFA Institute's exams.
  - Not complying with rules and policies of the CFA program.
  - Divulging the confidential information to others.
  - Improperly using the designation.
  - Misrepresenting information on Professional Conduct Statement of the CFA.
  - Cheating on the CFA exam, violate VII(A), I(D).
  - Cheating on the CPA exam, violate I(D).
- VII(A) 会员或候选人的行为（Conduct as Members and Candidates)。成员或候选人不得从事任何有损于 CFA 协会和 CFA 称号名誉和声望，以及 CFA 考试公正性和含金量的行为。CFA 考试或者其它任何考试中作弊都属于违反。
- over-promise the competency of an individual 和 over-promise future investment results as lower risk, higher performance 都不可以。
- The order of CFA and CPA has nothing to do.

- 如果要获得使用 CFA 称号的权利，必须满足几个条件：是 CFA 协会的在册会员，按时交会费（Membership due），依次通过 CFA 的三次考试，按时完成并提交年度述职报告（annual conduct report）
- 在名片上，CFA 的字体大小不能超过自己名字的字体大小
- CFA 是形容词，不是名词，不能说有几个 CFAs
- 唯一正确的表述是：CFA，Chartered Financial Analyst；其他说法都不对，如 cfa, C.F.A, CFA-typed, China-CFA
- CFA mustn't be used as part of the name of the firm.
- Shouldn't cite the expected date of exam completion and award of charter.
- 只通过三级考试，没有持证的人不可以自称 CFA.
- 广告中，如果说明三次考试一次就通过，只要陈述是事实就可以了；但是，如果说 CFA 持证人有高超的投资业绩，则违反了 VII (B)；
- 如果好几年没交会费，虽然以前是持证人，在名片后如果写 CFA，违反了 VII (B)。
- 成员不需要向 clients and prospective clients 披露 duty to comply with the Code。
- 持证人可以在个人的名片和个人的 letter head 上使用 CFA，但公司不可以。

1.28 GIPS

- In the past, a variety of reporting procedures were misleading at best. Some include:
  - Representative accounts-showing a top-performing portfolio as representative of firm's results.
  - Survivorship bias-excluding work performance.
  - Varying time periods- showing performance for selected time periods with outstanding returns.
- GIPS apply to investment management firms and are intended to serve prospective and existing clients of investment firms.
- Any investment management firm may choose to comply with the GIPS standards.
- Only investment management firms that actually manage assets can claim compliance.
- Software (and the vendors who supply software) cannot be "compliant". Software can assist firms in achieving compliance, but only an investment management firm can claim compliance.
- GIPS 的目标： To obtain worldwide acceptance of a standard of calculation and presentation; To ensure accurate and consistent investment performance data ; To promote fair, global competition among investment firms ; To foster the notion of industry self-regulation on a global basis
- Fundamentals of compliance: firm-wide basis, voluntary
- 关于 composite
  - Composite definition: a grouping of individual discretionary portfolios representing a similar investment strategy, objective, or mandate.
  - Include all actual fee-paying, discretionary portfolios in composites for a minimum of five years or since firm or composite inception. After presenting five years of compliant data , the firm must add annual performance each year going forward up to a minimum of ten years.
  - The firm asset is the aggregate of Fair Value of discretionary and un-discretionary portfolios, including fee-paying and non-fee-paying portfolios.
  - Terminated portfolio must be included in the composite.

- calculation methodology: portfolio 使用 time-weighted and geometrically linked；composite 使用 asset-weighted
- 不可以用 model 或者 simulated 来报告收益率

➢ **Historical performance record**

- Firms are required to present, at a minimum, 5 years of annual investment performance that is compliant with the GIPS standards.
- If the firm or composite has been in existence less that 5 years, the firm must present performance since the inception of the firm or composite.
- After a firm presents 5 years of compliant history, the firm must present additional annual performance up to 10 years, at a minimum. For example, after a firm presents 5 years of compliant history, the firm must add an additional year of performance each year so that after 5 years of claiming compliance, the firm presents a 10-year performance record.
- Firms may link a non-GIPS-compliant performance is presented after 1 January 2000 and the firm discloses the periods of noncompliance and explains how the presentation is not in compliance with the GIPS.

➢ 关于 **verification**

- Verification 是自愿的(GIPS verification: recommended, not required.)， Without such a report from the verifier, the firm cannot state that its claim of compliance with the GIPS Standards has been verified.
- A verification report must confirm that: the firm has complied with all the composite construction requirements of the GIPS standards on a firm-wide basis.
- The firm's processes and procedures are designed to calculate and present performance results in compliance with the GIPS standards.
- Verification of construction procedures and calculation method on firm-wide not on specific composite.
- Verified by independent third party

➢ 100% compliance: 绝对不说 “expect for”

➢ should disclose currency, creation data, a list of composite on require minimum asset level。

➢ Nine major sections of the GIPS standards: fundamental compliance, input data, calculation methodology, composite construction, disclosure, reporting, real estate, private equity, warped fee/separately managed account（注意没有 alternative investment）

- P/E: closed-end fund
- R/E: not including debt, CMBS, REITs; not include open-end and ever-green

2 数量分析

2.1 EAR

- $\text{EAR}=(1+\text{periodic rate})^{m}-1$
- **考察方法：**
  - 计算——算 EAR，或者是算计息次数
  - 定性（EAR 和计息次数有关）

2.2 Annuity and Annuity Due

- **内容：**
  - N = number of periods
  - I/Y = interest rate per period
  - PMT = amount of each periodic payment
  - FV= 0
  - Compute (CPT) present value (PV)
- **考察方法：**计算——N, I/Y, PMT, FV, PV 中任意给定四个，求另外一个

2.3 Perpetuity

- $\text{PV}=\frac{\text{PMT}}{1+\text{I/Y}}+\frac{\text{PMT}}{(1+\text{I/Y})^2}+\frac{\text{PMT}}{(1+\text{I/Y})^3}+\ldots=\frac{\text{PMT}}{\text{I/Y}}$

2.4 NPV and IRR Decision Rule

- **Single project Case**
  - NPV method: Accept it if NPV>0
  - IRR method: Accept it if IRR>r (required rate of return)
- **Two Projects Case**
  - Independent Projects
    - ✓ Similar to Single projects case
  - Mutually Exclusive Projects
    - ✓ NPV method: Choose the one with higher NPV
    - ✓ IRR method: Choose the one with higher IRR
    - ✓ NPV and IRR methods may conflict with each other

2.5 Rate of Return

- $HPY=\frac{P_1-P_0+CF_1}{P_0}$
- $r_{BD}=\frac{(F-P_0)}{F}\times\frac{360}{t}$
- $\text{HPY}=\frac{\text{r}_{\text{BD}}(\frac{\text{t}}{360})}{1-\text{r}_{\text{BD}}(\frac{\text{t}}{360})}$
- $EAY=(1+HPY)^{365/t}-1$

- $r_{MM} = HPY \times \frac{360}{t} = \frac{360 \cdot r_{BD}}{360 - t \cdot r_{BD}} = \frac{r_{BD}}{1 - t \cdot r_{BD}/360}$

2.6 Money-weighted and Time-weighted Rate of Return

- **time-weighted return 掌握概念及公式：**
  - 概念：Time-weighted rate of return measures compound growth.
  - 步骤及公式： Firstly, compute the HPR; then, compute (1+HPR) for each subperiod to obtain a total return for the entire measurement period [eg. (1+HPR1) * (1+HPR2)…(1+HPRn)].
- **money-weighted return 掌握概念及公式：**
  - 概念：the IRR based on the cash flows related to the investment
  - 步骤及公式： Firstly, determine the timing of each cash flow; then, using the calculation to compute IRR, or using geometric mean.
- **考察方法：计算；注意计算 time-weighted return 时，如果不是年度的 HPR 不用开方**

2.7 Measures of location

- Arithmetic mean: $\overline{X} = \frac{\sum_{i=1}^{N} X_i}{n}$
- Weighted mean: $\overline{X_W} = \sum_{i=1}^{n} w_i X_i = (w_1 X_1 + w_2 X_2 + \cdots + w_n X_n)$
- Geometric mean: $G = \sqrt[N]{X_1 X_2 X_3 \ldots X_N} = (\prod_{i=1}^{N} X_i)^{1/N}$
- Harmonic mean: $\overline{X_H} = \frac{n}{\sum_{i=1}^{n} (1/X_i)}$
- harmonic mean<= geometric mean<=arithmetic mean
- Quantiles
  - Quartile /Quintile/Deciles/Percentile
    - ✓ The third quartile: 75%, or three-fourths of the observations fall below that value.
  - Calculation Ly = (n+1)y/100, Ly is the position.

2.8 Measure of dispersion

- Range = maximum value – minimum value
- $MAD = \frac{\sum_{i=1}^{N} |X_i - \bar{X}|}{n}$
- For population: $\sigma^2 = \frac{\sum_{i=1}^{N} (X_i - \mu)^2}{N}$

- For sample: $s^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

2.9 Chebyshev's inequality

- 对任何一组观测值，个体落在均值周围 k 个标准差之内的概率不小于$1-1/k^2$对任意 k>1。
- This relationship applies regardless of the shape of the distribution

2.10 Coefficient of variation

- $CV=\frac{s_x}{\bar{X}}\times 100\%$

2.11 sharp ratio

- $\text{Sharp ratio}=\frac{R_P-R_f}{\sigma_P}$

2.12 Skewness

- Positive skewed: Mode<median<mean, having a right fat tail
- Negative skewed: Mode>media>mean, having a left fat tail
- **考察方法：**
  - 根据描述的特点判断是 Positively skewed 还是 Negative skewed
  - 根据已知的偏度，选择都有哪些特点

2.13 Kurtosis

- **考察方法：**
  - 根据描述的特点判断是 leptokurtic 还是 platykurtic
  - 根据已知的峰度，选择都有哪些特点
  - 可能在考试中会和 skew 合并考核综合知识

2.14 Odds

- **Odds for an event:** P(E)/(1-P(E))
- **Odds against an event:** (1-P(E))/P(E)

2.15 Probability rules

- **Joint probability : P(AB)**
  - Multiplication rule:
    - ✓ P(AB)=P(A|B)×P(B)= P(B|A)×P(A)
    - ✓ If A and B are mutually exclusive events, then: P(AB)=P(A|B)=P(B|A)=0
- **Probability that at least one of two events will occur:**
  - Addition rule:
    - ✓ P(A or B)=P(A)+P(B)-P(AB)
    - ✓ If A and B are mutually exclusive events, then: P(A or B)=P(A)+P(B)
- **Independence and Mutually Exclusive are quite different**
  - If exclusive, must not independence; Cause exclusive means if A occur, B can not occur, A influents B.
  - Independent events
    - ✓ P(A or B)=P(A)+P(B)-P(AB)
    - ✓ P(AB)=P(A)×P(B)

- **Total Probability Formula**
  - ✓ $P(A) = P(A|S_1)P(S_1) + P(A|S_2)P(S_2) + ... + P(A|S_N)P(S_N)$

2.16 Expected value, variance, covariance, and correlation

- **Expected value:** $\mathrm{E(X)} = \sum \mathrm{w_i} \times \mathrm{P}(x_i) = w_1 \times P(x_1) + w_2 \times P(x_2) + \cdots + w_n \times P(x_n)$
- **Variance:** $\sigma^2 = \sum_{i=1}^{N} P_i(X_i - EX)^2$
- **Covariance:** $\mathrm{COV(X,Y)} = \mathrm{E[(X\text{-}E(X))(Y\text{-}E(Y))]}$
- **Correlation:** $\rho_{XY} = \dfrac{\mathrm{COV(X,Y)}}{\sqrt{\mathrm{Var(X)Var(Y)}}} = \dfrac{\mathrm{COV(X,Y)}}{\sigma_X \sigma_Y}$
- **Portfolio expected value:** $\mathrm{E}(\mathrm{R_p}) = \mathrm{w_1 E}(\mathrm{R_1}) + \mathrm{w_2 E}(\mathrm{R_2})$
- **Portfolio variance:** $\sigma_{\mathrm{P}}^2 = \mathrm{w}_1^2\sigma_1^2 + \mathrm{w}_2^2\sigma_2^2 + 2\mathrm{w_1 w_2 cov}(\mathrm{R_1},\mathrm{R_2})$

2.17 Bayes' formula

- $P(A \mid B) = \dfrac{P(B \mid A)}{P(B)} \times P(A)$

2.18 Counting problem

- Multiplication rule: $\mathrm{n_1} \times \mathrm{n_2} \times \ldots\ldots \times \mathrm{n_k}$
- Factorial: $\mathrm{n}!$
- Labeling: $\dfrac{n!}{n_1! \times n_2! \times \ldots \times n_k!}$
- Combination: ${}_nC_r = \binom{n}{r} = \dfrac{n!}{(n-r)! \times r!}$
- Permutation: ${}_nP_r = \dfrac{n!}{(n-r)!}$

2.19 Discrete and continuous random variables

- Discrete random variables: the number of possible outcomes can be counted, and for each possible outcome, there is a measurable and positive probability.
- Continuous random variables: the number of possible outcomes is infinite, even if lower and upper bounds exist.

2.20 Discrete uniform random variable:

- The probabilities for all possible outcomes for a discrete random variable are equal.
- Probability distribution P(1)=P(2)=…=P(n)=1/n
- Cumulative distribution for the nth outcome $\mathrm{F}(x_n) = nP(x)$

2.21 Binomial random variable

- Probability function: $P(x) = \frac{n!}{(n-x)!x!} p^x (1-p)^{n-x}$
- Expected value: np
- Variance: np(1-p)

2.22 Normal distribution

- **Properties**:
  - X~N(μ , σ²)
  - Symmetrical distribution: skewness=0; kurtosis=3
  - A linear combination of normally distributed random variables is also normally distributed.
  - The tails get thin and go to zero but extend infinitely, asympotic (渐近）
- **Confidence intervals for a Normal distribution**
  - 90% CI for X : $\overline{X} - 1.65s$ to $\overline{X} + 1.65s$
  - 95% CI for X : $\overline{X} - 1.96s$ to $\overline{X} + 1.96s$
  - 99% CI for X: $\overline{X} - 2.58s$ to $\overline{X} + 2.58s$
- **Standard normal distribution**
  - if X~N(μ , σ²), then $Z = \frac{X - \mu}{\sigma}$ ~ N(0,1)
  - calculating probability using Z-values

2.23 Roy's safety-first criterion

- $[E(R_P) - R_L] / \sigma_P$

2.24 Lognormal distribution

- Right skewed
- Bounded from below by zero

2.25 Continuously compounded rate

- Effective annual rate (EAR) = $e^{R_{cc}} - 1$
- $\ln\left(\frac{S_1}{S_0}\right) = \ln(1+\text{HPR}) = R_{cc}$

2.26 Types of data

Time-series data	Cross-sectional data
a collection of data recorded over a period of time	a collection of data taken at a single point of time.

2.27 Central Limit Theory

- For simple random samples of size n from a population with a mean μ and a variance σ² but without known distribution, the sampling distribution of the sample mean

approaches N(μ， σ²/n) if the sample size is sufficiently large (n ≥30).

2.28 Standard error of the sample mean

- Known population variance: $\sigma_{\bar{x}} = \sigma / \sqrt{n}$
- Unknown population variance: $s_{\bar{x}} = s / \sqrt{n}$

2.29 Properties of an estimator

- **Unbiasedness:** expected value of the estimator is equal to the parameter that are trying to estimate
- **Efficiency:** for all unbiased estimators, if the sampling dispersion is smaller than any other unbiased estimators, then this unbiased estimator is called efficient.
- **Consistency:** the accuracy of the parameter estimate increases as the sample size increases. **(the standard deviation of the parameter estimate decreases as the sample size increases)**
  - As the sample size increases, the standard error of the sample mean falls.

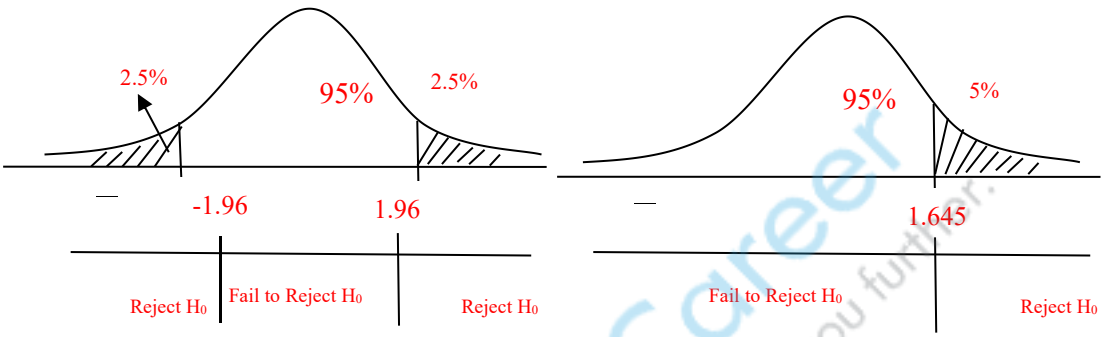
2.30 Measures of estimates

- **Point estimate:** the statistic, computed from sample information, which is used to estimate the population parameter
- **Confidence interval estimate:** a range of values constructed from sample data so the parameter occurs within that range at a specified probability. α —the level of significance
- **Interval Estimation（also see Chapter: Hypothesis Testing ）**
  - Level of significance （alpha）
  - Degree of Confidence （1—alpha）
  - Confidence Interval = [Point Estimate +/- (reliability factor) * Standard error]

2.31 Z-statistic and t-statistic

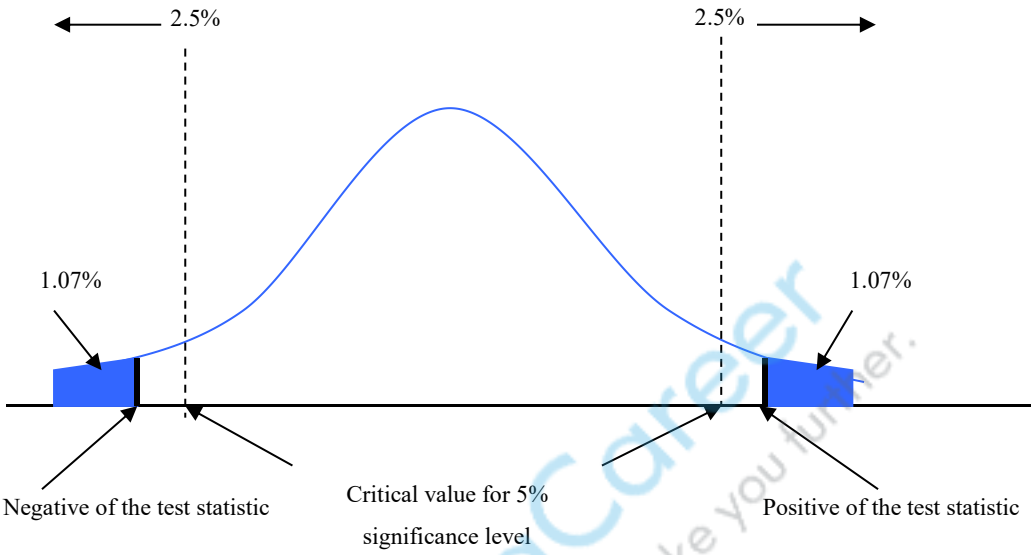
- $\bar{x} \pm z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$ (known variance)
- $\bar{x} \pm t_{\alpha/2} \frac{s}{\sqrt{n}}$ (unknown variance)

2.32 Hypothesis Testing



- Decision Rule:
  - Reject H0 if |test statistic|>critical value
  - Fail to reject H0 if |test statistic|<critical value

- *P* – value testing



P-value = 2.14%

- Type I error and Type II error
  - Type I error: reject the null hypothesis when it's actually true
  - Type II error: fail to reject the null hypothesis when it's actually false
  - Significance level (α): the probability of making a Type I error
    - ✓ Significance level =P(Type I error)
  - Power of a test: the probability of correctly rejecting the null hypothesis when it is false
    - ✓ Power of a test = 1−P(Type II error)
- **Summary of Hypothesis Testing**

检验类型	具体情况	检验统计量	服从分布
均值检验	单个正态总体，方差已知	$Z=\frac{\bar{x}-\mu_0}{\sigma/\sqrt{n}}$	N(0,1)
	单个正态总体，方差未知	$t_{n-1}=\frac{\bar{x}-\mu_0}{s/\sqrt{n}}$	t(n-1)
	两个正态总体，独立样本，方差未知但是相等	$t=\frac{\bar{x}_1-\bar{x}_2-(\mu_1-\mu_2)}{\left(\frac{s_p^2}{n_1}+\frac{s_p^2}{n_2}\right)^{1/2}}$	$t(n_1+n_2-2)$
	两个正态总体，独立样本，方差未知不相等	$t=\frac{\bar{x}_1-\bar{x}_2-(\mu_1-\mu_2)}{\left(\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}\right)^{1/2}}$	$t\left(\frac{\left(\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}\right)^2}{\frac{(s_1^2/n_1)^2}{n_1}+\frac{(s_2^2/n_2)^2}{n_2}}\right)$
	两个非独立总体，成对检验	$t=\frac{\bar{d}-\mu_0}{s_{\bar{d}}}$	t(n-1)

方差检验	单个正态总体	$\chi^2_{n-1}=\frac{(n-1)s^2}{\sigma_0^2}$	$\chi^2(n-1)$
	两个正态总体，独立样本	$F=s_1^2/s_2^2$	$F(n_1-1,n_2-1)$

注：其中 $s_p^2=\frac{(n_1-1)s_1^2+(n_2-1)s_2^2}{n_1+n_2-2}$，$s_{\bar{d}}=\frac{s_d}{\sqrt{n}}$

2.33 Technical analysis

- Principles:
  - Prices are determined by the interaction of supply and demand.
  - Only participants who actually trade affect prices, and better-informed participants tend to trade in greater volume.
  - Price and volume reflect the collective behavior of buyers and sellers.
- Assumptions:
  - Market prices reflect both rational and irrational investor behavior.
    - ✓ Investor behavior is reflected in trends and patterns that trend to repeat and can be identified and used for forecasting prices.
    - ✓ Efficient markets hypothesis dose not hold.
- The differences between technical and fundamental analysis
  - Fundamental analysis of a firm attempts to determine the intrinsic value of an asset by using the financial statements and other information.
  - Technical analysis uses only the firm's share price and trading volume data, and it is not concerned with identifying buyers' and sellers' reasons for trading, but only with the trades that have occurred.
  - Fundamentalists believe that prices react quickly to changing stock values, while technicians believe that the reaction is slow. Technicians look for changes in supply and demand, while fundamentalists look for changes in value.
- Advantages and disadvantages of technical analysis
  - Advantages of technical analysis:
    - ✓ Actual price and volume data are observable.
    - ✓ Technical analysis itself is objective (although require subjective judgment), while much of the data used in fundamental analysis is subject to assumptions or restatements.
    - ✓ It can be applied to the prices of assets that do not produce future cash flows, such as commodities.
    - ✓ It can also be useful when financial statement fraud occurs.
  - Disadvantage:
    - ✓ The usefulness is limited in markets where price and volume data might not truly reflect supply and demand, such as in illiquid markets and in markets that are subject to outside manipulation.
- Types of charts
  - Line Charts are the simplest technical analysis charts. They show closing prices for each periods as a continuous line
  - Bar charts add the high and low prices for each trading period and often include

the opening price and closing price as well.

- Candlestick charts use the same data as bar charts but display a box bounded by the opening and closing prices.
  - ✓ Box is clear: closing price>opening price;
  - ✓ Box is filled: closing price<opening price
- Point and figure charts are helpful in identifying changes in the direction of price movements.

➢ **Trend analysis**

- Uptrend line: connects the increasing lows in prices;
- Downtrend line: connects the decreasing highs in prices;
- Support level: buying is expected to emerge that prevents further price decreases.
- Resistance level: selling is expected to emerge that prevents further price increases.
- Change in polarity: breached resistance levels become support levels and that breached support levels become resistance levels.

➢ **Common chart patterns**

- Head-and-shoulders pattern
  - ✓ Head-and-shoulders pattern is used to project a price target for ensuing downtrend.
  - ✓ The size of the head-and-shoulders pattern: the difference in price between the head and the neckline.
  - ✓ Price target = Neckline – (Head – Neckline)
  - ✓ Inverse head and shoulders pattern: price target = neckline + (neckline – head)
- Triangles: form when prices reach lower highs and higher lows over a period of time.
- Rectangles: form when trading temporarily forms a range between a support level and a resistance level.
- Flags and pennants: refer to rectangles and triangles that appear on short-term price charts.

3 经济学

3.1 需求与供给基本概念

- **Demand and supple function**
  - Inverse demand function: PD= a -bQD ——需求曲线
  - Inverse supply function: PS =a+bQS ——供给曲线
    - ✓ In order to draw demand and supply curves, own price and own quantity must be allowed to vary. However, all other variables are held constant to focus on the relation of own price with quantity.
- Law of Demand and supply
  - ✓ demand decreases as the price increases
  - ✓ supply increases as the price increases
- Aggregating demand and supply curves:
  - ✓ Add the firms that comprise market supply together to get the market supply function.
  - ✓ Add the many individual demand curves to get the market demand function
- **Shift or move along**
  - Price 变化使得 move along 需求/供给曲线，其他因素导致 Shift
- **Stable and unstable equilibria**
  - Stable equilibrium:供给曲线从上向下穿过（从上压住）需求曲线
  - Unstable equilibrium:供给曲线从下向上穿过需求曲线

3.2 拍卖的基本概念

- **Common value auction VS Private value auction**
  - common value auction:拍卖商品对每一个 bidder 都具有相同的价值
  - Private value auction：拍卖商品对每一个 bidder 都具有不同的潜在价值
- **Common type of auctions**
  - ascending price auction (English auction):拍卖人先以一个保留价格起拍，出价最高的人获得这件商品
    - ✓ Winner's curse: bid more than the ultimate value of the asset for common goods.
  - sealed bid auction：每一个 bidder 将出价记录在一张纸上，并密封在信封中，which is unknown to other bidders
    - ✓ the optimal bid for the bidder with the highest reservation price
    - ✓ reservation price：密封拍卖中存在保留价格，若所有出价都低于这个保留价格，那么商品将不属于任何 bidder
  - second price sealed bid auction (Vickrey auction): Vickrey 拍卖类似于密封拍卖，但却有一个关键性差异：商品由出价最高的投标者获得，但却只需按第二高的出价支付
  - descending price auction (Dutch auction)：拍卖人先以一个较高价格起拍，然后逐步降低价格，直到某个投标人愿意接受这个价格为止
- **Noncompetitive bid**
  - U.S. Treasury securities, a single price auction is held but bidders may also submit Noncompetitive bid
  - bidders will accept the amount of Treasuries indicated at the price determined by the auction, rather than specifying a maximum price in their bids

3.3 Efficient allocation

- The efficient quantity of a good is achieved: marginal benefits = marginal cost (the intersect of demand and supply curve).
- The allocation efficiency is attained when marginal benefits equate marginal cost.
- At this equilibrium price and quantity, the sum of the consumer and producer surplus is at a maximum.

3.4 Surplus 的理解

- Consumer surplus: the difference between the total value to consumers of the units of a good that they buy and the total amount they must pay for those units
- Producer surplus: the sum of difference between the price received for each unit of good produced and the opportunity cost of each unit for the total units produced.

3.5 Price ceiling

- the upper limit on the price which a seller can charge. When placed below the equilibrium price, it makes seller provide less products, and dead weight loss is produced.
- In the long run, price ceilings lead to the following:(1) wait a long line to purchase（春运火车票）, (2) suppliers engage in discrimination, (3) take bribes to do so(rent-seeking), (4) suppliers reduce the quality of the goods.

3.6 Price floor

- the minimum price that a buyer has to pay for a good. When placed above the equilibrium price, it produces dead weigh loss.
- In the long run, price floor lead to the following: (1) overproduction(价格高，生产更多，卖不出去), (2) consumers will buy less if the price floor is above the equilibrium price. （工人的最低工资导致失业）

3.7 Tax 的理解:

- The actual tax incidence is independent of whether the government imposes the tax (statutory incidence) on consumers or suppliers.
- If demand is less elastic than supply, consumers will bear a higher burden.(弹性弱的一方承担更多税收)
- If supply is less elastic than demand, suppliers will bear a higher burden.
- **弹性越小，DWL 越小**

3.8 Subsidies

- 供给曲线下降 subsidy 个单位→市场均衡从 O 移动到 O'，均衡价格下降，均衡产量上升→形成一块 deadweight loss（如图箭头指向的三角形）

3.9 Quotas

- 供给曲线，需求曲线和市场均衡都没有变化→quotas 使市场处于非均衡状态，供给量小于需求量，形成供需缺口→形成一块 deadweight loss（如图箭头指向的三角形）

3.10 Elasticity 掌握概念及公式

- **需求点弹性、交叉弹性和收入弹性的计算，分母用平均值。**

$$\text{price elasticity of demand}=\frac{\text{percent change in quantity demanded}}{\text{percent change in price}}=\frac{\%\Delta Q}{\%\Delta P}$$

$$\text{cross elasticity of demand}=\frac{\text{percent change in quantity demanded}}{\text{percent change in price of substitute or complement}}$$

$$\text{income elasticity of demand} = \frac{\text{percent change in quantity demanded}}{\text{percent change in income}}$$

- Inelasticity demand & elasticity demand 商品的定价策略，怎样才能使受益最大化
- Different kinds of goods:
  - Normal Goods: positive income elasticity, demand rises with income. (> 0)
    - ✓ Luxuries: high positive elasticity, demand rises strongly with income. (>1)
    - ✓ Necessity goods: normal but low elasticity
  - Inferior Goods: negative income elasticity, demand falls with income (<0)
- 商品的价格与它的互补品的需求量正向，商品的价格与它的替代品的需求量成反向
- **Factors influencing the elasticity of demand:**
  - Availability of substitutes个, higher
  - Relative amount of spent on the good 个,higher
  - Time period since price change 个,higher
- **Factors influencing the elasticity of supply:**
  - Availability of substituting inputs个, higher.
  - Time period since price change, long-term>short-term>momentary（供电弹性大，水果小）
- **Price elasticity along a linear demand curve**
  - Point in a higher price range has greater price elasticity of demand than point in the lower price range.
  - Revenue is maximized at the point that has unitary elasticity (elasticity=-1)

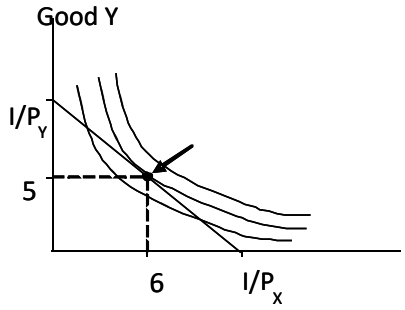
3.11 消费者行为理论

- Utility theory（消费者偏好）
  - A utility function（ordinal utility）: U=U(Q,QB,...,QN)
  - Assumption: for bundle A, B and C, ">" stand for prefer
    - ✓ complete preference: U(A)>U(B), U(B)>U(A), U(A)=U(B) (indifference)
    - ✓ transitive preference: U(A)>U(B), U(B)>U(C)=>U(A)>U(C)
    - ✓ non-satiation: U(A+1)>U(A), more is better
- Indifference curve 特征
  - 较高无差异曲线的效用高于较低无差异曲线
  - 同一消费者无差异曲线不向交
  - 无差异曲线向右下倾斜
  - 无差异曲线凸向原点，是凸图形(convex)
- 边际替代率(MRS)
  - MRSXY =-△Y/ △X(商品 X 对商品 Y 的替代）例如： MRSXY＝3，X 对 Y 的替代率为 3，即增加（＋1）X，放弃（-3）Y，效用水平不变。
  - If two consumers (A and B) have different MRS, they can both benefit from voluntary trade until MRSAXY=MRSBXY
- 边际替代率递减规律：在维持效用水平不变的前提下，随着一种商品的消费数量连续增加，消费者为得到每一单位的这种商品所需要放弃的另一种商品的消费数量是递减的。（随着 X 越来越大，放弃的 Y 数量越来越小，斜率绝对值越来越小）
- Budget constraint (预算约束线）

- Consumption option are determined by income & price；PXQX+PYQY<=I

➢ Consumer equilibrium (最优化选择)

- Utility is maximized, subject to the budget constraint
- Tangency between budget constraint & the highest attainable indifference curve
- At Tangency, MRSXY（边际替代率，消费者意愿）= Price ratio（相对价格，市场意愿）



I/P_X为横坐标截距
I/P_Y为纵坐标截距
P_X/P_Y为预算线斜率

3.12 Subsitution effect and income effect

➢ Substitution effect：商品 X 价格减低时，商品 X 相对于其他商品相对价格减,Consumer equilibrium 在无差异曲线上移动，带来对商品 X 需求量的增加

➢ Income effect：商品 X 价格减低时，消费者实际购买力变化，real income 提高，budget constraint 曲线移动带来对商品 X 需求量的变化。

➢ When decrease in the price of Good X:

- The substitution effect is positive, and the income effect is also positive—consumption of Good X will increase.
- The substitution effect is positive, and the income effect is negative but smaller than the substitution effect—consumption of Good X will increase.
- The substitution effect is positive, and the income effect is negative and larger than the substitution effect—consumption of Good X will decrease, Giffen goods

➢ Giffen goods(吉芬商品):

- Income effect （inferior goods） > Substitution effect
- demand curve has positive slope

➢ Veblen goods(韦伯伦商品, Conspicuous goods): Price is used by the consumer to signal the status in the society

- have a positively sloped demand curve (eg: Gucci bag)
- But when price increases, the slope may be negative.

➢ two important distinctions between Giffen goods and Veblen goods.

- First, Giffen goods are inferior goods (negative income effect), while Veblen goods certainly are not.
- Second, the existence of Giffen goods is theoretically supported by the rules of consumer choice, while the existence of Veblen goods is not.

3.13 Shutdown point & Breakeven point

➢ **Shutdown point:**

- If AR < AVC in the short run, the firm should shut down. This is its **short-run shutdown point.**

- If AR ＞ AVC in the short run, the firm should continue to operate, even if it has losses.
- In the long run the firm should shut down if AR < ATC. This is the **long-run shutdown point.**

➢ **Breakeven point**

- If AR = ATC, TR = TC (economic cost), this is the firm's **breakeven point.**
- If AR ≥ATC, firm stay in the market in both the short and long run
- If AR ≥ AVC, but AR < ATC, the firm stay in market in the short run but will exit the market in the long run
- If AR < AVC, the firm shut down in the short run and exit the market in the long run

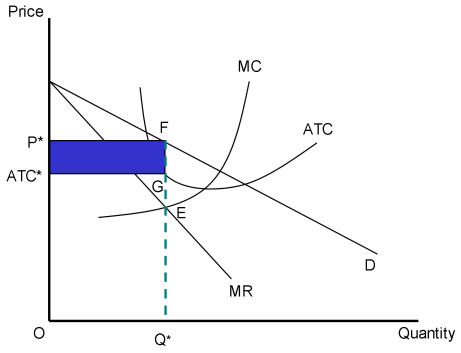
3.14 Perfect competition

➢ For perfect competition(also price taker market):

- All the firms in the market produce identical products.
- pure competition is price-taker, all others are price-searcher
- There is a large number of independent firms.
- Each seller is small relative to the size of the total market.
- There is no barrier to entry or exit.
- 短期内：MR=MC，可能有 economic profit 或者 economic loss；在有 economic loss 时，当 AVC<P<ATC 时，可以继续生产，P<AVC 时，要关停.（shut down point）
- Individual firm's demand schedule is perfectly elastic (horizontal).
- 长期内：无经济利润或损失（因为无进出壁垒）只有 normal return，均衡条件是 P=MR=MC=ATC。

3.15 Monopoly

➢ Single seller, high barriers(legal barriers and natural barriers)



➢ Monopolists are price searchers (face downwards sloping demand curves) and have imperfect information about demand, so they must experiment with different prices (search) to find the profit maximizing price/quantity with always be in the elastic range of the demand curve for the firm's product.

➢ 短期和长期的均衡条件都是 MR=MC（利润最大化的条件）,相比于完全竞争市场，垄断市场的产量较少，价格较高，并且有 dead weight loss.

➢ $MR = P \times (1 - \frac{1}{\varepsilon_P})$

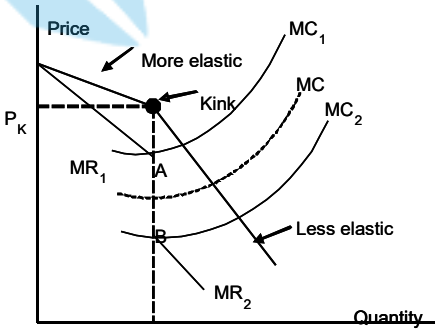
- Price discrimination reduces this inefficiency by increasing output toward the quantity where marginal benefit equals marginal cost, and the dead weight loss is smaller. An extreme case of price discrimination is perfect price discrimination. If it were possible for the monopolist to charge each consumer the maximum they are willing to pay for each unit, where would be no dead weight loss, since a monopolist would produce the same quantity as under perfect competition. With perfect price discrimination the consumer surplus would all be captured by the monopolist.
- For price discrimination to work the seller must:
  - Downward sloping demand curve
  - At least two identifiable groups of customers with different price elasticity of demand for the product
  - Prevent the customers paying the lower price from reselling the product to the customers paying the higher price
- Government regulation:

  ① Average cost pricing is the more common form of regulation at the point where ATC=D. This will
  - Increase output and decrease price.
  - Increase social welfare (allocative efficiency).
  - Ensure the monopolist a normal profit since price=ATC.

  ② Marginal cost pricing forces the monopolist to reduce price to the point where MC=D. this will: Increase output and reduce price. However, the price may be lower than ATC, requiring subsidy by government.

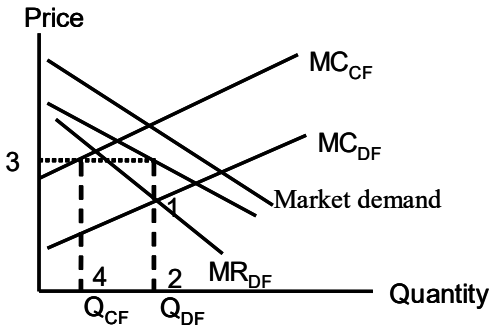
3.16 Oligopoly market

- For oligopoly:
  - Oligopoly is a form of market competition characterized by (1) small number of sellers (2) interdependence among competitors (3) large economies of scale (4) significant barriers to entry (5) either similar or differentiated products
  - Four traditional oligopoly models (1) The kinked demand curve model of oligopoly is based (2)Cournot duopoly model (3)Nash equilibrium model (4 Stackelberg dominant firm model
- The kinked demand curve model of oligopoly
  - Assumption: each firm believes that if it raises its price, others will not follow, but if it cuts its price, other firms will cut theirs
  - Between range A and B, the optimum Q is constant, can't determine price



Q_K Max profit

- Cournot model
  - only two firms competing (eg: a duopoly 双寡头模型)
  - both have identical and constant marginal costs of production
  - each firm knows the quantity supplied by the other firm in the previous period and assumes that is what it will supply in the next period(两个厂商都准确地了解市场需求曲线)
  - construct a demand curve and marginal revenue curve for its own production (共同面临的市场需求曲线是线性的)
  - 市场成本为零
- Dominant firm model
  - a single firm has a significantly large market share： greater scale & lower cost structure
  - market price is essentially determined by the dominant firm
  - the other competitive firms take this market price as given.
  - The order of decision: 1→2→ 3→4



- Game Theory
  - Oligopoly firm's decisions are interdependent, assumptions about a competitor will react to particular price and output decision by a competitor can determine the optimal output and pricing strategy.
  - The price will be between the monopoly price and the perfect competition price which equals marginal cost.

3.17 Market Concentration

- The N-Firm Concentration Ratio is the percentage of the value of sales accounted for by

the firms in an industry.

- The Herfindahl-Hirschman Index (HHI) is the square of the percentage market share of each firm summed over the largest 50 firms (or summed over all the firms if there are
  - In a competitive market, HHI<1000
  - In a moderately competitive market, 1000<HHI<1800
  - In an uncompetitive market, HHI>1800

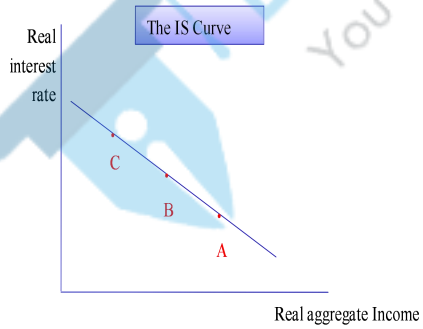
3.18 GDP 的计算

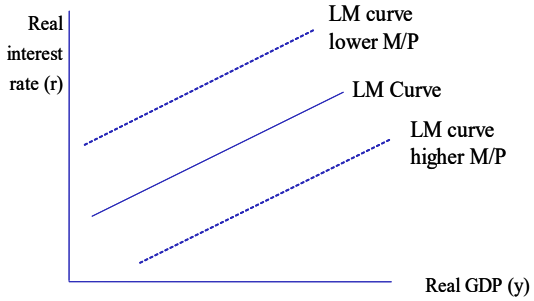
- **expenditure approach**：GDP = C + I + G + (X - M)
- **income approach**：GDP = national income + capital consumption allowance + statistical discrepancy

3.19 国民收入核算

- National income is the sum of the income received by all factors of production that go into the creation of final output.
- national income = compensation of employees (wages and benefits)
  +corporate and government enterprise profits before taxes
  +interest income
  +unincorporated business net income (business owners' incomes)
  +rent
  +indirect business taxes - subsidies (taxes and subsidies that are included in final prices)
- Personal income= national income +transfer payments to households- indirect business tax - corporate business tax - undistributed corporate profit
- Personal disposable income= personal income - personal taxes

3.20 IS and LM curves





- If income and expenditure are to remain in equilibrium, there must be an *inverse relationship between the real interest rate and income*. In economics, this relationship is called the IS curve, because investment (I) and savings (S) are the primary variables that adjust to maintain the balance between expenditure and income.
- In equilibrium, there is a *positive relationship between real income and the real interest rate* for a given level of the real money supply

3.21 Aggregate Demand

- AD 曲线说明 Real GDP 与物价水平之间呈反向关系
  - 原因：更高的物价水平降低了实际财富，提高了实际利率并使国内生产的产品相比于国外产品更贵，所有这些因素使得国内产出下降
- Movement & shift
  - a change in the price level is represented as a movement along the AD curve

- an increase in aggregate demand is shown by a shift to the right, indicating that the quantity of goods and services demanded is greater at any given price level.

➢ The factors that affect aggregate demand:

- Increase in consumers' wealth: households' wealth ↑→proportion of income saved↓& spending↑→C↑
- Consumer expectations of future income: 消费者预期未来收入增加从而会增加当前消费
- Business expectations: When businesses are more optimistic about future sales, they tend to increase their investment in plant, equipment, and inventory, which increases aggregate demand (I ↑).
- High capacity utilization：资本效用提高从而 PPE 投资增加
- Expansionary monetary policy： (a)rate of growth of the money supply↑→puts downward pressure on interest rates→PPE 投资↑; (b) rate↓→credit↑→分期付款消费↑
- Expansionary fiscal policy ： taxes increases↓→disposable income and consumption， government spending↑→AD directly ↑(C increases for tax cut, G increases for spending increase
- Exchange rates ： A decrease in the relative value of a country's currency will increase exports and decrease imports. Both of these effects tend to increase domestic aggregate demand (net X increases).
- Global economic growth: GDP growth in foreign economies tends to increase the quantity of imports (domestic exports) foreigners demand.

3.22 Aggregate Supply Curve

➢ Factors can cause the SRAS curve to shift to the right:

- (1) Labor productivity
- (2)Input prices
- (3)Expectations of future output prices
- (4)Taxes and government subsidies
- (5)Exchange rates

➢ Factors that will shift the LRAS curve are

- (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

3.23 Stagflation

➢ Stagflation：both high unemployment and increasing inflation

➢ Stagflation is generally associated with a sharp decrease in aggregate supply.即 supply shock 导致 AS 突然大幅下降从而使得 GDP 下降，物价上升，例如 1973 年的石油危机

➢ An investor anticipating stagflation should:

- Decrease investment in fixed income securities in anticipation of higher inflation and nominal interest rates.
- Decrease investment in equities as revenue and profit margins will decrease.
- Increase investment related to commodities in anticipation of higher commodity

prices.

3.24 Business cycle

- Business cycles have four phases: trough\expansion\ peak\contraction
  - Two consecutive quarters of growth in real GDP as the beginning of an expansion and two declining as the beginning of a contraction
  - Only applies to the economies that consist of business, not the state-control and subsistence agriculture.
- Resource use fluctuation
  - 经济扩张接近波峰时，sales 增加放缓，unsold 存货累积，从而 inventory-sales ratio 高于正常水平
  - 存货增加无论是计划还是非计划都计入 GDP
  - 如果只看到 GDP 增加而没看到 inventory-sales ratio 增加，会错误认为 GDP 依然强劲而不是开始衰退, lagging indicator
- Housing Sector activity
  - Mortgage rates: 利率低，卖方热情高，房屋开工率高
  - Housing costs relative to income: 收入增长如果不及房价增长，买房热情下降，房屋开工率低
  - Speculative activity: 高房价导致房产过量供应，resulting in falling prices that decreased or eliminated speculative demand and led to dramatic decreases in housing activity overall.
  - Demographic factors: 25 到 40 岁年龄段人口所占比重与 housing sector activity 正相关
- External trade sector activity
  - 影响进出口水平的因素主要有 domestic GDP growth，GDP growth of trading partners 以及汇率
- 经济周期特点
  - Trough:
    - ✓ GDP growth rate changes from negative to positive
    - ✓ High unemployment rate, increasing use of overtime and temporary workers.
    - ✓ Spending on consumer durable goods and housing may increase
    - ✓ Moderate or decreasing inflation rate
  - Expansion:
    - ✓ GDP growth rate increases
    - ✓ Unemployment rate decreases as hiring accelerates
    - ✓ Investment increases in producers' equipment and home construction
    - ✓ Inflation rate may increase.
    - ✓ Imports increase as domestic income growth accelerates
  - Peak
    - ✓ GDP growth rate decreases.
    - ✓ Unemployment rate decreases but hiring slows
    - ✓ Consumer spending and business investment grow at slower rates
    - ✓ Inflation rate increases
  - Contraction/recession
    - ✓ GDP growth rate is negative

- ✓ Hours worked decrease, unemployment rate increases
- ✓ Consumer spending, home construction, and business investment decrease
- ✓ Inflation rate decreases with a lag.
- ✓ Imports decrease as domestic income growth slows

3.25 Theories of the business cycle

- Neoclassical theory:强调技术进步会同时影响 AD 与 AS, economy has strong tendency toward 充分就业均衡，该学派的结论是经济周期是长期均衡的暂时偏离
- Keynesian cycle theory：投资的变动是由 fluctuation in business confidence (animal spirits)，这是 AD 变化的主要原因。凯恩斯认为需要政府干预，新古典和货币主义认为不需政府干预
- In contrast to the New Classical school the Neo-Keynesian school assumes slow-to-adjust (sticky) prices and wages. The Neo-Keynesian models show that markets do not reach equilibrium immediately and seamlessly, but even small imperfections may cause markets to be in disequilibrium for a long time.所以 Neo-凯恩斯认为价格变化比新古典主义认为的更慢
- New Keynesian cycle theory：工资是根据 past rational expectation 确定，所以 unexpected and currently expected fluctuation in AD 将使得经济周期出现。
- New classical cycle theory（RBC）: rational expectation of price level 是由 potential GDP and expected AD 决定。Only unexpected fluctuation in AD 将使得经济周期出现。
- Austrian school: Believe cycles are caused by government intervention in the economy
- Monetarist cycle theory: fluctuations in both investment and consumption expenditure, driven by fluctuations in the growth rate of the quantity of money, are the main source of fluctuations in AD，将使得经济周期出现。

3.26 Unemployment

- 失业的类型
  - 摩擦性失业：雇员找到雇主所需的 time lag 造成
  - 结构性失业：由 long-run changes in the economy 造成，某些工种淘汰，又催生了新的工种
  - 周期性失业：由 changes in the general level of economic activity 造成。当经济运行低于 full capacity 时候，周期性失业为正。
- Unemployment rate: ratio of unemployed to labor force.

$$\text{unemployment rate} = \frac{\text{number of unemployed}}{\text{labor force}} \times 100$$

- Activity (or participation) ratio: ratio of labor force to total population of working age (i.e., those between 16 and 64 years of age).

$$\text{labor force participation rate} = \frac{\text{labor force}}{\text{Working} - \text{age population}} \times 100$$

- NAIRU（natural rate of employment）
  - It is the rate of unemployment at which inflationary pressures are stable, below which inflation would accelerate
  - Analysis in this area recognizes that not all labor is alike
  - Structural factors related to training deficiencies, cultural patterns in all or some of the population, inefficiencies in the labor market, and the like can mean that the economy will effectively face labor shortages long before the unemployment

rate reaches very low figures.

3.27 Inflation

- **Inflation rate**
  - Inflation rate = [(Current CPI - year-ago CPI) / year - ago CPI] 100
  - CPI = (cost of basket at current prices / cost of basket at base period prices) *100
  - Core inflation:价格指数计算中剔除了食品与能源，因此更好的反映价格变化趋势
- **Laspeyres index**
  - uses a constant basket of goods and services ,most countries calculate consumer price inflation this way
  - Three factors cause a Laspeyres index of consumer prices to be biased upward as a measure of the cost of living: new goods, quality changes, commodity substitution
- **Paasche index**
  - A Paasche index uses the current consumption weights, prices from the base period, and prices in the current period.
- **Fisher index.**
  - A Fisher index the geometric mean of a Laspeyres index and a Paasche index
  - $Index_{Fisher}=(I_P*I_L)^{1/2}$
  - can solve the substitution bias.
- **Hedonic pricing**
  - can be used to adjust a price index for product quality.
- **Inflation**
  - Demand-pull inflation: (1) increase in the quantity of money, (2) Increase in government purchases. (3)Increase in exports.
  - Cost-push inflation: (1) increase in money wage rates. (2) increase in the money prices of raw materials
  - non-accelerating inflation rate of unemployment (NAIRU), also called the natural rate of unemployment

3.28 先行，同步与滞后经济指标

Leading	Reason
S&P 500 Stock Index	Because stock prices anticipate economic turning points, both up and down, their movements offer a useful early signal on economic cycles.
Money supply, real M2	Because money supply growth measures the tightness or looseness of monetary policy, increases in money beyond inflation indicate easy monetary conditions and a positive economic response, whereas declines in real M2 indicate monetary restraint and a negative economic response.

Interest rate spread between 10-year treasury yields and overnight borrowing rates (federal funds rate)	Because long-term yields express market expectations about the direction of short-term interest rates, and rates ultimately follow the economic cycle up and down, a wider spread, by anticipating short rate increases, also anticipates an economic upswing. Conversely, a narrower spread, by anticipating short rate decreases, also anticipates an economic downturn.
Index of Consumer Expectations, University of Michigan	Because the consumer is about two-thirds of the U.S. economy and will spend more or less freely according to his or her expectations, this gauge offers early insight into future consumer spending and consequently directions in the whole economy.

Coincident	**Reason**
Employees on non-agricultural payrolls	Once recession or recovery is clear, businesses adjust their fulltime payrolls.
Aggregate real personal income (less transfer payments)	By measuring the income flow from non-corporate profits and wages, this measure captures the current state of the economy.
Industrial Production Index	Measures industrial output, thus capturing the behavior of the most volatile part of the economy. The service sector tends to be more stable.
Manufacturing and trade sales	In the same way as aggregate personal income and the industrial production index, this aggregate offers a measure of the current state of business activity.
Lagging	**Reason**
Average Duration of Unemployment	Because businesses wait until downturns look genuine to lay off, and wait until recoveries look secure to rehire, this measure is important because it lags the cycle on both the way down and the way up.
Inventory—sales ratio	Because inventories accumulate as sales initially decline and then, once a business adjusts its ordering, become depleted as sales pick up, this ratio tends to lag the cycle.

3.29 Fisher effect

- $R_{Nom} = R_{Real} + E[I] + RP$

3.30 Central bank

- **Role of central bank:**
  - Sole supplier of currency (发行货币)
  - Banker to the government and other banks （最终贷款）
  - Lender of last resort
  - Supervise banks (监管)
  - Holder of gold and foreign exchange reserves
  - Conductor of monetary policy
- **Central banks manage money supply in order to**

- Maintain price stability
- Promote full employment
- Maximum sustainable long-term growth of the economy
- Moderate long-term interest rate

➢ **Three Policy Tools of the central bank**

- required reserve ratio ： most powerful tool
- open market operations： is most frequently used tool
- discount rate ：央行处于被动地位

➢ **Central bank should be:**

- Independence:
  - ✓ operational independence: allowed to independently determine the policy rate
  - ✓ target independence: central bank define how inflation is computed, sets the target inflation level, and determines the time horizon to achieve
  - ✓ ECB has both, while most central banks have only operational independence.
- Credible: too much debt leads to incredible; self-fulfilling prophecies
- Transparent

➢ **预期通胀与未预期通胀**

- 完全预计：The prices of all goods and wages could be indexed to this inflation rate. Increased demand → price increases more; decreased demand → price increases less
- 未预计：
  - ✓ 通胀高于预期，borrowers gain，反之 lenders gain
  - ✓ volatile inflation rates, lenders require higher interest rates
  - ✓ information about supply and demand from changes in prices becomes less reliable.
  - ✓ unexpected inflation can increase the magnitude or frequency of business cycles, impose real costs on an economy

➢ **inflation targeting, Interest rate targeting 和 Exchange rate targeting**

- interest rate targeting：increasing the money supply when specific interest rates rose above the target band and decreasing the money supply when rates fell below the target band
- Inflation targeting：现在更常用，经常 target 在 2%；央行对 2 年以后的 inflation 进行 targeting
- Exchange rate targeting：发展中国家常用
  - ✓ Targeting country 和 targeted currency 会有相同通胀率
  - ✓ Interest rates and conditions in the domestic economy must adapt to accommodate the target and domestic interest rates and money supply can become more volatile.
  - ✓ 局限性：本币汇率低于 target，但已经没有外汇储备了

3.31 Fiscal policy

➢ **Fiscal Policy Tools:** Spending Tools, Revenue Tools & Desirable attributes of tax policy

➢ **Spending Tools:**

- Transfer payments: redistribute wealth, taxing some and making payments to

others, transfer payments are not included in GDP computations.

- Current spending: government purchases of goods and services on an ongoing and routine basis.
- Capital spending: government spending on infrastructure such as roads, schools, bridges, and hospitals

➢ **Revenue Tools**

- Direct taxes are levied on income or wealth. These include income taxes, taxes on income for national insurance, wealth taxes, estate taxes, corporate taxes, capital gains taxes, and Social Security taxes
- Indirect taxes are levied on goods and services. These include sales taxes, value-added taxes (VATs), and excise taxes.
- 间接税的执行速度较快

➢ **Advantages of fiscal policy tools**

- Social policies such as discouraging tobacco use can be implemented very quickly via indirect taxes
- Quick implementation of indirect taxes also means that government revenues can be increased without significant additional costs

➢ **Disadvantages of fiscal policy tools**

- Direct taxes and transfer payments take time to implement, delaying the impact of fiscal policy
- Capital spending also takes a long time to implement. The economy may have recovered by the time its impact is felt.

3.32 Interaction of monetary and fiscal policies

Monetary policy	Fiscal policy	Interest rate	output	Private spending	Public spending
Tight	Tight	higher	lower	lower	lower
Easy	Easy	lower	higher	higher	higher
Tight	Easy	higher	***higher***	lower	higher
Easy	Tight	lower	***varies***	higher	lower

3.33 GDP 与 GNP

➢ GNP measures the market value of all final goods and services produced by factors of production supplied by residents of a country, regardless of whether such production takes place within the country or outside of the country.

➢ GNP 与 GDP 的差异

- GDP includes, and GNP excludes, the production of goods and services or income to capital owned by foreigners within that country.
- GNP includes, and GDP excludes, the production of goods and services or income to capital owned by its citizens outside of the country.
- GDP 更贴近于一个国家的经济活动，就业率及增长率

3.34 Absolute advantage & Comparative advantage

➢ Absolute advantage refers to the lower absolute cost to produce a product.

➢ Comparative advantage refers to the lower opportunity cost to produce a product

➢ The law of comparative advantage holds that trading partners can be made better off if

they specialize in the production of goods for which they are the low-opportunity cost producer and trade for those goods for which they are the high-opportunity cost producer.

3.35 产生比较优势的原因

- **Ricardian model:** has only one factor of production----labor; comparative advantage and pattern of trade are determined by labor productivity due to differences in technology between countries.（技术差异）
- **Heckscher-Ohlin model:** comparative advantage and pattern of trade are determined by differences in factor (factor & labor) endowments between countries.（生产要素禀赋区别）

3.36 Types of trade restrictions

- Types of trade restrictions tariffs, quotas, export subsidy, voluntary export restraint, minimum domestic content
- Domestic (importing) country, import quotas, tariffs, and VERs 的效应:
  - Reduce imports.
  - Increase price.
  - Decrease consumer surplus.
  - Increase domestic quantity supplied.
  - Increase producer surplus.

3.37 Balance of Payments Components

- The current account measures the exchange of merchandise goods, services, investment income, and unilateral transfers (gifts to and from other nations). The current account balance equals the sum of exports minus imports, net interest income, and net transfer. 在 BOP（国际收支平衡表）中，interest income 属于 current account
- The capital account consists capital transfer（债务豁免，移民） and net sales of non-produced\non-financial assets（版权，自然资源的买卖）.
- The financial account measure net capital flows based on sales and purchases of domestic and foreign financial assets. (financial assets aboard 在国外金融资产 and foreign-owned financial assets 国外拥有的在国内的金融资产)

3.38 汇率

- 名义与实际汇率
  - FX real = FX nominal ×(price in Europe/price in U.S.)
  - FX real(d/f) = FX nominal (d/f) CPIf/CPId
- FX Appreciation and Depreciation

1.7799CHF/USD to 1.8100CHF/USD ➡ USD appreciated therefore CHF depreciated

- **Spot rates** & **Forward rates**
  - Spot rates：exchange rates for immediate delivery of the currency
  - Forward rates ： exchange rates for currency transactions that will occur in the future.（例如，现在约定一个月后以多少人民币买 1 美元）
- **The spread on a forward foreign currency quotation**
  - Consider a 6-month (180 days) forward exchange rate quote from a U.S. currency dealer of GBP:USD = 1.6384 / 1.6407.
    Percentage spread = (1.6407 – 1.6384) / 1.6407 = 0.14%
  - Spreads increase with greater exchange rate volatility, the term of the forward

contract, and decrease when trading volume is higher.

- Forward currency spreads are typically greater than spot currency spreads

➢ **Forward discount or premium**

- $\begin{pmatrix}\text{forward prmium}\\ \text{or discount}\end{pmatrix}=\left(\frac{\text{F-S}}{\text{S}}\right)\times\left(\frac{360}{\text{t}}\right)$

3.39 弹性论

$$\omega_M=\frac{\text{Imports}}{\text{imports + exports}} \qquad \omega_X=\frac{\text{exports}}{\text{imports + exports}}$$

➢ ε_M : elasticities (as positive numbers) of demand for imports

ε_X : elasticities (as positive numbers) of demand for emports

- Given Marshall-Lerner condition : $\omega_X\varepsilon_X+\omega_M(\varepsilon_M-1)>0$
- When import expenditures=export revenues 即 $\omega_X=\omega_M$
- Marshall-Lerner condition 简写为 $\varepsilon_X+\varepsilon_M>1$

4 财务报告分析

4.1 Accrual Basis

Unearned revenue	The firm receives cash before it provides a good or services to customers Example: newspaper, magazine	• No revenue recognized • A liability
Accrued revenue	The firm provides goods or services before it receives cash payment Example: manufacturer sells goods to retail stores "on account"	• Revenue recognition • An asset
Prepaid expenses	The firm pays cash ahead of time for an anticipated expense Example: rent	• No expense recognized • An asset
Accrued expenses	The firm owes cash for expenses it has incurred Example: salary (wages payable)	• Expenses recognition • A liability

- **考察方法：**
  - 甄别四种应用对 B/S 与 I/S 的不同影响
  - 判断四种应用中收入费用在何时予以实际确认

4.2 Flow of information in an accounting system

- Journal entries and adjusting journal entries: sorted by date
- General ledger and T-account: all business transactions by account
- Trial balance and adjusted trial balance

4.3 Audit opinion

- Unqualified (clean) opinion: free from material errors, fraud, or illegal acts
- Qualified opinion: if statements make any exceptions to the accounting principles, can issue qualified opinion and explain the exceptions
- Adverse opinion: if not presented fairly or not materially conforming with accounting standards.
- Disclaimer of opinion: If the auditor is unable to express an opinion (e.g., in the case of a scope limitation), a disclaimer of opinion is issued.
- An unqualified audit opinion conveys that the financial statement report a "true and fair view" or are "fairly presented" in accordance with applicable accounting standards.
- The auditors must also express an opinion on the company's internal control systems according to Sarbanes-Oxley Act.
- **考察方法：**在具体情况下，判别不同的审计类型

4. 4 Other Information Sources of Financial Statements 掌握概念：

- Financial footnotes
  - includes information about account methods and assumptions; related-party transactions; commitments and contingencies
  - footnote 是被审计过的
- Supplementary schedule: provides explanatory information, such as operating income or sales by region or business segment;
- MD&A (Management Discussion & Analysis):
  - Management must highlight any favorable or unfavorable trends, and

- Identify significant events and uncertainties that affect the company's liquidity, capital resources, and results of operations;
- Such as, to provides information about the effects of inflation, changing prices

➢ Proxy statement: provides useful information regarding
- Management and director compensation;
- Company stock performance;
- Any potential conflicts of interest between management, shareholders and board;
- Relevant current information on their websites and press release and as part of conference calls.

➢ Annual filing (10-K) & quarterly report (10-Q): generally present the 4 key financial statements and footnotes but are not audited.

➢ 8-K: reported to SEC, which includes material corporate events on a more current basis, such as M&A

4.5 Financial Statement 指标：掌握概念

➢ U.S. GAAP and IFRS
- Standard-setting bodies: make the rules, such as FASB——U.S. GAAP; IASB——IFRS
- Regulatory authorities: enforce the rules, such as SEC——美国；FSA——英国

➢ Qualitative characteristics of financial statement, U.S.GAAP 更重视 relevance 和 reliabilityfaithful presentation（two fundamental characteristics）

➢ Four characteristics enhance relevance and faithful presentation
- Understandability
- Relevance: materiality and timeliness
- Reliability: faithful representational, substance over form, prudence, completeness neutrality, timeliness
- verification
- Comparability

➢ Constraints on financial statement
- Relevant vs. Timely
- Cost vs. benefits
- Non-quantifiable

➢ coherent of financial reporting framework (underlying logic)
- Transparency
- Comprehensiveness
- Consistency

➢ Standard-setting approach
- Principles-based: require the prepares of financial reports and auditors to exercise considerable judgment in financial reporting — IFRS
- Rules-based: establishes specific rules for each element or transaction — U.S. GAAP
- U.S. GAAP 将慢慢转变为 Objectives Oriented（结合以上两者）

4.6 Steps in the Financial Statement Analysis Framework — 6 个步骤

➢ State the objective and context

- Gather data：所有财务报表信息的搜集
- Process the data：将财务报表搜集的信息做处理，如计算 ratio
- Analyze and interpret the data：将分析出来的各种 ratio 进行分析
- Report the conclusions or recommendations
- Update the analysis
- **考察方法：**记住各个步骤的进入与产出信息

4.7 Accounting equation 主要掌握计算

- **内容：**
  - A=L+E
  - Owners' Equity = Contributed Capital + R/E
  - Revenue – Expense=NI
  - $R/E_E = R/E_B + NI - DIV$ (NI= Revenue – Expense)
  - SO, $A=L + \text{Contributed Capital} + R/E_E$

    $A=L + \text{Contributed Capital} + R/E_B + \text{Revenue} - \text{Expense} - DIV$

4.8 Unusual or infrequent items and Extraordinary items

- Unusual or infrequent items (nonrecurring items)
  - reported "above the line" and presented on a pretax basis
    - ✓ G/L from the sale of assets or part of a business
    - ✓ Impairments, write-offs, write-downs, and restructuring costs.
- Extraordinary items (presented on net of tax)
  - Loss from expropriation of assets;
  - Gains or losses from early retirement of debt;
  - Uninsured losses from natural disasters.
- **考察方法：**辨别给定事项的种类

4.9 **Liquidity，activity and solvency ratios 主要掌握分类、概念及计算**

- Current ratio = Current assets / Current liabilities
- Quick ratio = [cash + marketable securities + receivable] / Current liabilities
  = [current asset - inventories] / Current liabilities
- Cash ratio = [cash + marketable securities] / Current liabilities
- Defensive interval = (cash + marketable securities + receivables) / average daily expenditures
- Receivables turnover = annual sales / average receivables.
- Inventory turnover = cost of goods sold / average inventory.
- Payables turnover = purchase / average accounts payable.
- Average receivables collection period = 365 / receivables turnover.
- Average inventory processing period = 365 / inventory turnover.
- Average payment period = 365 / payables turnover.
- **Cash conversion cycle = A/R collection period + inventory period – A/P payment period**
- Total asset turnover = revenue / average total assets
- Fixed asset turnover = revenue / average net fixed assets
- Working capital turnover = revenue / average working capital

- Debt-to-equity ratio =total debt / equity
- Debt-to-capital
- Debt-to-assets = total debt / total assets
- Financial leverage = average total assets / average total equity
- Interest coverage = operating profit / interest expense = EBIT / I
- Fixed charge coverage = (EBIT + lease payments) / (interest expense + lease payments)

4.10 DuPont system of analysis 杜邦分因素分析析十分重要，3 因素和 5 因素都要掌握，尤其是 5 因素分析。

- $\text{Return on equity} = \frac{\text{net income}}{\text{sales}} \times \frac{\text{sales}}{\text{assets}} \times \frac{\text{assets}}{\text{equity}}$
- $\text{Return on equity} = \text{profit margin} \times \text{asset turnover} \times \text{financial leverage}$ 3 因素
- $\text{Return on equity} = \frac{\text{net income}}{\text{EBT}} \times \frac{\text{EBT}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{revenue}} \times \frac{\text{revenue}}{\text{assets}} \times \frac{\text{asset}}{\text{equity}}$
- $\text{Return on equity} = \begin{pmatrix}\text{tax}\\ \text{burden}\end{pmatrix}\begin{pmatrix}\text{interst}\\ \text{burden}\end{pmatrix}\begin{pmatrix}\text{EBIT}\\ \text{margin}\end{pmatrix}\begin{pmatrix}\text{asset}\\ \text{turover}\end{pmatrix}\begin{pmatrix}\text{financial}\\ \text{leverage}\end{pmatrix}$ 5 因素
- **考察方法：**杜邦分析的内容有可能和权益里的内容一起考，

4.11 Basic EPS and diluted EPS 主要掌握计算

$$\text{basic EPS} = \frac{NI - div_{preferred\ stock}}{\text{weighted average number of common shares outstanding}}$$

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

$$= \frac{\begin{bmatrix}\text{net income}\\ \text{-preferred div.}\end{bmatrix} + \begin{bmatrix}\text{convertible}\\ \text{preferred div.}\end{bmatrix} + \begin{bmatrix}\text{convertible}\\ \text{debt}\\ \text{interest}\end{bmatrix}(1-t)}{\begin{bmatrix}\textit{weighted}\\ \textit{average}\\ \textit{shares}\end{bmatrix} + \begin{bmatrix}\text{shares from}\\ \text{conversion of}\\ \text{conv. pfd. shares}\end{bmatrix} + \begin{bmatrix}\text{shares from}\\ \text{conversion of}\\ \text{conv. debt}\end{bmatrix} + \begin{bmatrix}\text{shares}\\ \text{issuable from}\\ \text{stock opt.}\end{bmatrix}}$$

4.12 Revenue recognition 主要掌握不同确认方法的差异

	Methods	Descriptions	Implications
	Delivery method	The standard	If cash is received before providing, revenue is not recognized until it is earned.
			Examples:
			Sale of magazine; credit card fees; equipment leases based on usage

LT contract **计算**	**Percentage-of-completion method**	Logical extension of the sales basis method for long term contracts	Used for long-term projects when there is a contract and there are reliable estimates of the revenues, costs and completion time.
			Measurement of the proportion of work completed:
			1) An engineering estimate or physical milestone
			2) The ratio of incurred costs to the total estimated cost
	Completed contract method	Revenues will lag behind;	Used for long-term projects when there is no contract or estimate of revenues/costs are unreliable.

F/S	**Items**	**POC**	**Completed Contract**
CFS	Cash flows	Same	Same
I/S	Income Volatility	Less	Reverse
	Net Income	Greater	
B/S	Total assets	Greater	
	Liabilities	Less	
	Shareholder equity	Greater	
Ratio	D/E Ratio	Less	

Installment contract	**Installment sales method**	Similar to percentage of completion method;	Used when no way to estimate the likelihood of collecting the proceeds but costs of the goods and services are known.
		Should compare cash flow statement and income statement	
	Cost recovery method	Similar to the completed contract method; Profit is not recognized until all aspects of the sale (revenues and costs) are made;	Used when costs are not known or when uncertainties surround the collection of the proceeds.

		Must rely on the cash flow statement	Sales are recognized when cash is received, but no gross profit is recognized until the costs is fully recovered by cash payments

4.13 OCI（Other comprehensive income）

- Foreign currency translation gains and losses
- Adjustments for minimum pension liability
- Unrealized gains and losses from cash flow hedging derivatives
- Unrealized gains and losses from available-for-sale securities
- **考察方法：**判断哪些项目属于综合收益

4.14 Marketable Securities 主要掌握收益的会计处理

Category	Measurement	Unrealized/Realized Gains or Losses
Held-to-maturity	Amortized cost	Unrealized: not reported Realized: reported in income statement
Trading	Fair value	Unrealized: reported in income statement Realized: reported in income statement
Available-for-sale	Fair value	Unrealized: reported in equity Realized: reported in income statement

4.15 FCFF and FCFE 主要掌握计算

- **FCFF** is calculated from **Net Income**:
  FCFF = NI + NCC + [Int * (1 - tax rate)] – FCInv – WCInv
  = EBIT*(1-tax rate) + NCC – FCInv - WCInv
- **FCFF** is calculated from **CFO**:
  FCFF = CFO + [Int * (1 - tax rate)] – FCInv
- **FCFE** is calculated as follows:
  FCFE = CFO – FCInv + Net borrowing
- 计算公司价值的时候，用 FCFF，并且折现率使用 WACC
- 计算股东价值的时候，用 FCFE，并且折现率用 r_e

4.16 Barter Transaction 下的收入确认

- Barter transaction: two parties exchange goods/services without cash payment
  - US GAAP recognize revenue at fair value basing on historical experience
  - IFRS recognize revenue at fair value basing on similar nonbarter transactions with unrelated parties

4.17 Gross Revenue and Net Revenue

- Gross revenue: 公司分开记录收入和支出。
- Net revenue: 公司只记录收入和支出的差额。
- 确认为 gross revenue 是有条件的：the company is the primary obligor under the contract, bears risk, can choose the supplier, and has reasonable latitude to establish price；
- 如果不满足以上条件，确认为 net revenue，比如代售，代销确认的就是 net

4.18 Direct and indirect method to calculate CFO

- Direct Method
  - Converts an accrual-basis income statement into a cash-basis income statement.

Calculation of CFO by Direct method	
Cash received from customers	Opening A/R + net sales – Closing A/R=Net sales- Δ A/R
- Cash paid to suppliers	-COGS+ Δ A/P+Depreciation included in COGS - Δ Inventory
- Cash paid to employees	Opening wage payables + wage expense – Closing wage payables =-wage expense+ Δ wage payables
- Interests paid	Opening interest payables + interest expense – Closing interest payables=-interest expense + Δ Interest payables+Amortization of bond discount
- Tax paid	Opening tax payables + income tax expense – Closing tax payables = - income tax expense + Δ tax payables
= CFO	

- Indirect Method (for CFO only)
  - Net income is converted to operating cash flow by making adjustments for transactions that affect net income but are not cash transactions.

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

4.19 CFI 和 CFF 掌握概念及公式：

- CFI consist of the inflows and outflows of cash resulting from the acquisition or disposal of long-term assets and certain investments.
  - 计算方式：proceeds received – purchasing；也就是 sales – purchasing
  - CFI=- (BV_1+depreciation-BV_0)+gain-loss
- CFF consist of the inflows and outflows of borrowing, repayment, new issue, repurchase,

div paid

- Dividend paid = Dividend declared + Δ dividend payables
- Opening R/E + Net Income – Dividend declared = Ending R/E

4.20 CF Statement 中其它需要掌握的知识点

- Comparison of classification between IFRS and GAAP
  - Interest received: Classified as CFO under U.S. GAAP; CFO or CFI under IFRS.
  - Interest paid: Classified as CFO under U.S. GAAP; CFO or CFF under IFRS.
  - Dividend received: Classified as CFO under U.S. GAAP; CFO or CFI under IFRS.
  - Dividend paid: Classified as CFF under U.S. GAAP; CFO or CFF under IFRS.
  - Overdraft: IFRS: cash equivalent; GAAP: CFF
- Comparison of presentation between IFRS and GAAP
  - Direct method is encouraged under both
  - US. GAAP: a direct method must also disclose indirect method. IFRS: not required
  - US. GAAP: tax and interest can be reported in CF/S or in the footnotes. IFRS: should be disclosed separately in the CF/S under direct and indirect method.
- Non-cash transactions are not reported in CF statement, but is required to be closed, either in a separate note or a supplementary schedule to the cash flow statement.（比如可转债由债转成股）

4.21 **COGS 掌握计算**

- COGS = beginning inventory + purchases - ending inventory

4.22 不同存货计价方法下的 COGS 比较

- During periods of rising prices and stable or increasing inventory levels:
  LIFO COGS > weighted average COGS > FIFO COGS

4.23 Inventory valuation

- Inventory costs (product costs) should be **capitalized** in the inventories account
  - Purchase cost
  - Conversion costs (labor, resource…)
  - Allocation of fixed production overhead based on normal capacity levels (depreciation)
  - Other costs necessary to bring the inventory to its present location and condition (freight)
- Inventory costs (period cost)should be **expensed** in the period occurred
  - Unallocated portion of fixed production overhead
  - Abnormal waste of materials, labor, or overhead
  - Storage costs (unless required as part of the production process)
  - Administrative overhead
  - Selling costs

4.24 了解在两种不同的会计准则下存货的计价方式：

- **U.S. GAAP:**
  - Lower of cost or market
  - NRV-normal profit margin < market (replacement cost) < NRV

- no write-up allowed under U.S.GAAP and no reversal after devaluation

➢ IFRS:
- Lower of cost or NRV
- NRV = sales price-selling cost
- inventory can be written up but only limited to the loss recognized previously

Reporting inventory above the historical cost is only permitted under IFRS and U.S. GAAP in certain industries such as agricultural and forest products, mineral ores, and precious metals.

4.25 LIFO liquidation, the inventory value under FIFO is lower, and COGS under LIFO is lower；LIFO liquidation 是财务舞弊的一种常用方式，通过使用老旧存货降低 COGS，达到操作 net income 的手段。LIFO liquidation 的重要特征是 LIFO reserve 下降。

4.26 其他有关存货的重要知识点

➢ LIFO 真实反映了 COGS，FIFO 真实反映了存货的价值，所以 LIFO 对利润表更合适，FIFO 对资产负债表更合适。

➢ 只有存货计价方法会影响现金流，其它方法都不会影响总体现金流，因为存货记账方法会影响税收。

➢ LIFO 真实反映了 COGS（I/S reflect economic value），FIFO 真实反映了存货的价值 (B/S reflect economic value), regardless of the direction of change in price..

➢ IFRS 不允许用 LIFO 的方法；LIFO 方法是美国特有的，而且专有“LIFO conformity rule”允许美国公司在财务报表上也用 LIFO 计算

4.27 实地盘存制（periodic inventory system）与永续盘存制（perpetual inventory system）

➢ In a periodic inventory system:
- Inventory values and COGS are determined at the end of the accounting period.
- No detailed records of inventory are maintained; rather, inventory acquired during the period is reported in a Purchase account.
- At the end of the period, purchases are added to beginning inventory to arrive at cost of goods available for sale.
- To calculate COGS, ending inventory is subtracted from goods available for sale.

➢ In a perpetual inventory system:
- Inventory values and COGS are updated continuously.
- Inventory purchased and sold is recorded directly in inventory when the transactions occur. Thus, a Purchase account is not necessary.

➢ For the FIFO and specific identification methods, ending inventory values and COGS are the same whether a periodic or perpetual system is used.

➢ However, periodic and perpetual inventory systems can produce different values for inventory and COGS under the LIFO and weighted average cost methods.

➢ **考察方式：**概念及计算

4.28 Depreciation method

Depreciation		
Straight-Line	Accelerated Depreciation	Units – of – production

SL depreciation expense = $\frac{\text{cost} - \text{residual value}}{\text{useful life}}$	*Double – declining* balance(DDB) DDB depreciation in year X = (2/asset life in years)× net book value at the beginning of year X	$\frac{\text{original cost - salvage value}}{\text{life in output units}} \times \text{output units in the period}$

- **考察方式：**计算不同方法下折旧额

4.29 Impairment

- Impairment under US GAAP
  - Recoverability 的度量标准：carrying value> undiscounted cash flow
  - Loss measurement: carrying value- fair market value/discounted cash flow
  - Can't reverse the recognized loss
- Impairment under IFRS
  - Carrying value> max [Fair Value- selling cost, PV(value in use)]
  - Can reverse the loss, the revaluation will be recognized in equity. Revaluing the asset's value upward is even permitted under IFRS.
- Impairment effect
  - PP&E cost (asset) decrease & NI decrease (due to impairment expenses)
  - But NI of next year will higher caused by lower PP&E level
  - impairment 对 ratio 的影响：在确认减值的当期，ROA，ROE 较小。在以后的几期，ROA, ROE 变大（decreased depreciation)。
  - The impact of Valuing asset upward to financial ratios: low leverage (high asset),high ROA/ROE in the period of revaluation and low ROA/ROE in subsequent periods.

4.30 利息的资本化和费用化：

- Capitalized expenditures are classified as CFI. Expensed expenditures are classified as CFO； The asset you capitalized today will be expensed in the future.
- Under IFRS：income earned by temporarily investing borrowed funds reduces the interest that is eligible for capitalization.
- under U.S. GAAP：no such reduction of capitalized interest

4.31 资本化和费用化对财务报表的影响

- Net income: 费用化的 NI 当期较低，以后较高；资本化的 NI 当期高，以后稍低，利润表随时间波动小。
- Shareholder's equity 与 Net Income 的变化趋势相同。
- Cash flow: 费用化的现金流支出归入 CFO，因而费用化的 CFO 低；资本化的现金流归入 CFI，所以资本化 CFI 低。
- Financial ratios: ROA/ROE 与 NI 同向变化，费用化当期 ROA/ROE 比较低，以后比较高，资本化当期 ROA/ROE 高，以后比较低，资本化 ROA/ROE 比较平稳。
- Interest coverage ratio (EBIT/ interest expense): 资本化前期 Interest coverage ratio 比较大，因为 interest expense 小，后期比较小，因为 EBIT 小；费用化前期 Interest coverage ratio 比较小，因为 interest expense 比较大，后期比较大，因为 EBIT 后期比较大。
- 如果问哪一种财务处理较保守、激进，相对应，应该是资本化（激进）还是费用化（保守）

4.32 Types and accounting treatment of intangible Assets

- Software development costs

- Under U.S. GAAP
  - ✓ For sales to others
    - Expensed as incurred.
    - Once economic feasibility is established, subsequent production costs can be capitalized.
  - ✓ For own internal use
    - Capitalized
- No special requirements under IFRS

➢ Advertising costs: These are expensed as incurred. Exception is direct-response advertising that results in probable future benefits.

➢ Goodwill: Created in a business combination. When purchase price > net asset fair value, annual impairment test, no amortization. Capitalized only in purchase transactions

4.33 Investment property 的计价方法

➢ The cost model
- The cost model for investment property is the same as the cost model for valuing property, plant, and equipment,

➢ The fair value model
- The fair value model is different from the revaluation model we described earlier.
  - ✓ Under the revaluation model, any revaluation above historical cost is recognized as revaluation surplus in owners' equity.
  - ✓ For investment property, however, revaluation above historical cost is recognized as a gain on the income statement.

Transfer From	Transfer To	Financial Statement Treatment
Owner-occupied	Investment property	Treat as revaluation: recognize gain through I/S 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

4.34 Deferred tax——Temporary difference 主要考察计算

Deferred tax assets	Deferred tax liabilities
B/S amounts that result from an excess of tax payable over income tax expense that are expected to be recovered from future operations.	B/S amounts that result from an excess of income tax expense over taxes payable that are expected to result in future cash outflows.

4.35 Asset/Liability approach（asset tax base）:

➢ （Asset）Asset tax base = deductible asset in the future (from the taxing)

➢ （Asset）Accounting base = Carrying value of asset (from the accounting)

=BV-accumulated depreciation-impairment

- Accounting base < tax base asset, treat as DTA
- Accounting base > tax base asset, treat as DTL（会计多记资产，必须增加负债）

- (Liability) Liability tax base = carrying value of the liability - any amounts that will be deductible on the tax return in the future 或者 carrying value - any amounts of the revenue that will not be taxable in the future
- (Liability) Accounting base= carrying value of the liability
- (Liability) Accounting base- Liability tax base ＝be deductible on the tax return in the future 或者 not be taxable in the future
- Accounting base < tax base liability, treat as DTL
- Accounting base > tax base liability, treat as DTA（会计多记负债，必须增加资产）
- Tax credit is permanent difference which will not affect future tax expense.

4.36 计算由于税率改变引起的 income tax expense 变化

- New-DTL = Old-DTL / Old-Rate　New-Rate
- Income tax expense = tax payable + △DTL - △DTA
- Tax rate ↑ DTL↑ DTA↑
- Tax rate↓ DTL↓ DTA↓

4.37 Valuation allowance for DTA:

- 当由于企业经营状况恶化，从而可能导致 DTA 未来无法回转时，要确认 Valuation allowance.
- Increasing the valuation allowance can decrease DTA, increase income tax expense and decrease net income. The net DTA can be reversed by decreasing valuation allowance, resulting in higher earning.
- 在分析时，当分析师认为 DTL 不会回转时，DTL 全额视为 equity；会反转时，现值作为负债，剩余部分计入到 Equity，再计算 D/E。

4.38 The benefit of lease

- Less costly financing
- Reduced risk of obsolescence
- Less restrictive provisions
- Off-balance-sheet financing
- Tax reporting advantage

4.39 **Classification of leases**

- Operating lease
  - An operating lease is essentially a rental arrangement. No asset or liability is reported by the lessee and the periodic lease payments are simply recognized as rental expense in the income statement.
- Finance lease / Capital lease (U.S.)
  - A finance lease is, in substance, a purchase of an asset that is financed with debt. Accordingly, at the inception of the lease, the lessee will add equal amounts to both assets and liabilities on the balance sheet. Over the term of the lease, the lessee will recognize depreciation expense on the asset and interest expense on the liability.

IFRS 下，

Finance lease	Operating lease
Transfers from lessor to lessee substantially all the risks and rewards incidental to ownership of an asset. ① **Title transfer** ② **Bargain purchase option** ③ **The lease term is for the major part of the economic life of the asset** ④ **At the inception of the lease the present value of the minimum lease payments amounts to at least substantially all of the fair value of the leased asset** ⑤ **A specialized nature**	A lease other than a finance lease.

US GAAP 下

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

4.40 Lease effects to CF

		Finance lease	Operating lease
	CFO	Higher	Lower
	CFF	Lower	Higher
	Total CF	Same	Same

4.41 两种 lease 的方式对于报表呈现与和相关 ratio 的影响

- 凡是 capital 的处理，都会引起 A 和 L 的增加, CFO 被高估，在 capital lease 中 Dep., Int. 也会同时增加，所以 NI 低；但是 dep.不会大于 lease payment，所以相对 operating lease，

EBIT 高。Remember, all the financial ratios deteriorate with financial lease, except EBIT and CFO

- 在 Capital lease 中，增加的 Liability 部分包含 ST 和 LT，其中 ST 是利息—即为 CFO；LT 是本金—即为 CFF

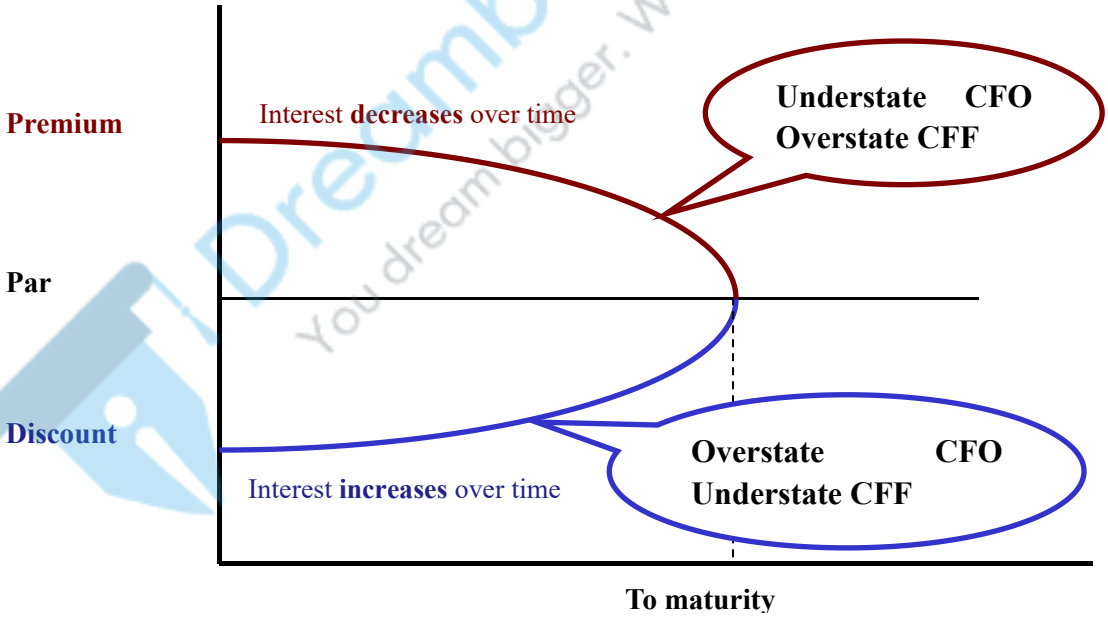
4.42 Sales-type lease and direct-financing lease

Lessor 的 capital lease 又分为两种： sales-type (PV> Fair Value of leased asset) 和 direct-financing

- 记账区别：sales-type 在期初会确认一笔毛利 gross profit= PV of MLP – (Cost of assets – PV of salvage)；但是 direct-financing 不确认毛利，而是把 PV of MLP 当做一笔借款借给承租人，将来收利息
- 期初现金流区别：sales-type 在期初有现金流；而 direct-financing 没有现金流
- 期中现金流区别：sales-type 和 direct-financing 有 CFO inflow，都是 int. revenue

4.43 债券的利息费用变化趋势

Carrying value of bond on B/S



Par bonds	Premium bonds	Discount bonds
Market rate=coupon rate Cash paid=CR.*Par	Market rate<coupon rate Interest expense = cash paid - amortization of premium	Market rate>coupon rate Interest expense = cash paid + amortization of discount
Interest expense is constant	Interest decreases over time	Interest increases over time
	CFO 低估；CFF 高估	CFO 高估；CFF 低估

4.44 Off-balance Sheet 的理解：

- Take-or-pay contracts 调整：Should add the PV of minimum future commitments to both property and debt.
- Sales of receivable 调整：当 A/R 还没有收回时，A/R 和 current liability 增加，CFO 降低

- 卖 A/R 的 gain 或者是 loss 是要移走的，loss 会使得 EBIT 变大在没有摊销之前，和 discount bond 的道理是相通的

4.45 四种现金流操纵的方式，并了解其对于 CF/S 的影响：

- Stretching accounting payable: delay pmt → CFO↑
- Financing accounts payable: manage timing of CFO
- Securitizing accounts receivable: sale A/R → CFO↑
- Repurchasing stock to offset dilutive effects of stock option: option exercise → CFF↑; repurchase → CFO↑& CFF↓

5 企业理财

5.1 Types of Capital projects

- Replacement projects
  - Replacement decision to maintain the business
  - Replacement decision for cost reduction purpose
- Expansion projects
  - Expansion projects for existing product
  - Expansion projects for new product or new services
- Mandatory investment: regulatory, safety, and environmental project
- Other projects: projects are not easily analyzed through the capital budgeting process
- **考察方法：**题目给定 project 特征，判断是那种 project。注意，Mandatory investment 的 NPV 一般为负值。

5.2 Basic Principles of Capital Budgeting

- Incremental cash flows: Cash flows will change if the project is undertaken.
- Ignore:
  - Sunk costs (any costs that cannot be avoided, even if the project is not undertaken, consulting fee, advertisement costs).
  - Financing costs / interest cost (financing costs are included in the project cost of capital or WACC).
- Include:
  - Externalities
    - ✓ A positive externalities (the product benefits sales of a firm's other product lines)
    - ✓ A negative externalities ◊Cannibalization（侵蚀效应）(New project takes sales from an existing product)
- Cash flows are based on Opportunity costs
  - Opportunity cost （cash flows that a firm will lose by undertaking the project, generally an asset the firm already owns）
- **考察方法：**判断 cash flow 是否 Incremental cash flows，cost 是否 Opportunity cost

5.3 Project Evaluation Methods- NPV

- $$NPV = CF_0 + \frac{CF_1}{(1+k)^1} + \frac{CF_2}{(1+k)^2} + \ldots + \frac{CF_n}{(1+k)^n}$$
- Selection
  - For independent projects: NPV>0, increase the firm value, accept the project; NPV<0 decrease the firm value, do not accept the project.
  - For mutually exclusive projects: Choose the one with the highest NPV

5.4 Project Evaluation Methods - IRR

$$\sum_{t=1}^{n} \frac{CF_i}{(1+IRR)^i} = CF_0 \quad \textbf{OR} \quad NPV = 0$$

- IRR: the discount rate that makes NPV equal to zero.
- IRR> the required rate of return, accept the project; IRR<the required rate of return, reject the project.

5.5 Payback Period (PBP)

- $$PBP = \text{full years until recovery} + \frac{\text{unrecovered cost at the beginning of last year}}{\text{cash flow during the last year}}$$
- Definition: the number of years it takes to recover the initial cost of an investment
- Selection
  - Mutually Exclusive vs. Independent Project: shorter PBP
  - Minimum Acceptance Criteria:
    - ✓ VS. industry average
    - ✓ Actually, no economically meaning

5.6 Discounted payback period(DPB)

- Definition: the number of years it takes for the cumulative discounted cash flows from a project to equal the original investment.
- Advantages
  - An indication of a project's risk and liquidity
  - Considers time value of money
- Disadvantages
  - Ignores cash flows after the payback period
- **考察方法：**计算

5.7 Profitable Index (PI)

$$PI = \frac{PV\ of\ future\ cash\ folow}{\mathrm{CF}_0} = 1 + \frac{NPV}{CF_0}$$

- **考察方法：**直接计算，或者已知 PI 值与 CF，问哪一个项目最值得投资（即 NPV 最大）

5.8 NPV & IRR Calculation

- Advantages of NPV & IRR
  - Based on Cash flows
  - Considering Time value of money
  - Take into account the cash flows generated over the whole project life
- Disadvantages of IRR
  - Conventional cash flows pattern Vs. Unconventional cash flow pattern
  - Multiple IRRs or no IRR under unconventional CF
  - Unrealistic reinvestment assumption
- Key advantage of NPV: Consistent with the goal of shareholders wealth maximization
- 决策：当 IRR 与 NPV 发生矛盾时，managers 选用 NPV
- Criteria preference: European countries prefer PB over NPV and IRR; larger public companies prefer NPV&IRR; managers with higher education level prefer NPV&IRR.
- **考察方法：**使用 NPV 与 IRR 考察项目可行性，两种方法各自的优缺点。

5.9 WACC

- $$WACC = (w_d)[k_d(1-t)] + (w_{ps})(k_{ps}) + (w_{ce})(k_s)$$
  - 要素一：税盾——Cost of Debt 需要乘以(1 -t)
  - 要素二：Weighted
    - ✓ 首选是用公司的 target capital structure；

- ✓ 再选用 market value（如此题）；
- ✓ 如果都没有提供，就用公司管理层所提供的公司 optimal capital structure trend
- ✓ 这些条件都不满足的时候，用同行业的平均 capital structure 作为参考

➢ **考察方法：**直接计算

5.10 Asset Beta and equity Beta

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

➢ **考察方法：**直接计算

5.11 Country equity risk premium

➢ $$k_{ce} = R_f + \beta[E(R_{MKT}) - R_F + CRP]$$

CRP: country risk premium

$$CRP = \text{Sovereign yield spread} \times (\frac{\text{Annualized standard deviation of equity index of developing country}}{\text{Annualized standard deviation of sovereign bond market in terms of the developed market currency}})$$

➢ Sovereign yield spread= difference between the yields of government bonds in the developing country and Treasury bonds of similar maturities.

5.12 Marginal Cost of Capital (MCC)

➢ $$\text{Break point} = \frac{\textit{amount of capital at which the component's cost of capital changes}}{\textit{weight of the component in the capital structure}}$$

➢ 首先当公司 R/E 不够用于发展的时候，有两种方式增加 capital，一个是 debt，一个是 equity。我们都知道发债具有税盾作用，所以公司一开始都采用发债，rd 和 re 都是增加的，但是由于借债的成本低且有税盾作用，所以 MCC 先下降后上升，下降的原因是 debt 和 equity 的 trade-off，也就是 balance。（不是由于 economies of scale）

➢ ★optimal capital structure：首先 WACC 是最小，而且此刻 MCC=WACC，就会达到最优资本结构

➢ ★IOS 是资金的需求曲线，是企业将所有的投资项目按 IRR 从大向小排，就形成了需求；而 MCC 是资金的供给曲线，一般来讲，融资越多，成本越高。企业在选择时，肯定时选 IRR>MCC 的项目，最后当 MCC 和 investment opportunity schedule 的交点，就形成了 optimal capital budgeting。

➢ **考察方法：**计算对应阶段的 optimal capital

5.13 Floatation cost

➢ Floatation cost: the costs associated with the issuance of new securities

- Charged by investment bank, while based on the size and type of offering
- Preferred stock & debt: do not usually incorporate flotation costs in the estimated cost of cost of capital because this cost is quite small < 1%

- Common stock: should be considered (about 5%)

➢ Method 1:

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

➢ Method 2:

- In fact, floatation costs are a cash flow at the initiation of the project Consider as CF_0

➢ **考察方法：**不同情况下 Floatation cost 应当在 discount rate 还是在 CF 中考虑。

5.14 Degree of operating leverage (DOL)

➢ Definition: the percentage change in operating income (EBIT) that results from a given percentage change in sales

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

➢ $$DOL = \frac{Q(P-V)}{Q(P-V)-F} = \frac{S-TVC}{S-TVC-F}$$

5.15 Degree of financial leverage (DFL)

➢ Definition: the ratio of the percentage change in the net income (EPS) to the percentage change in EBIT

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

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

5.16 Degree of total leverage (DTL)

➢ Definition：this ratio combines the degree of DOL and DFL and measures the sensitivity of EPS to change in sales

$$DTL = DOL \times DFL$$

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

➢ $$DTL = \frac{Q(P-V)}{Q(P-V)-F-I} = \frac{S-TVC}{S-TVC-F-I}$$

➢ **考察方法：**DTL 的定义与计算

5.17 Breakeven point

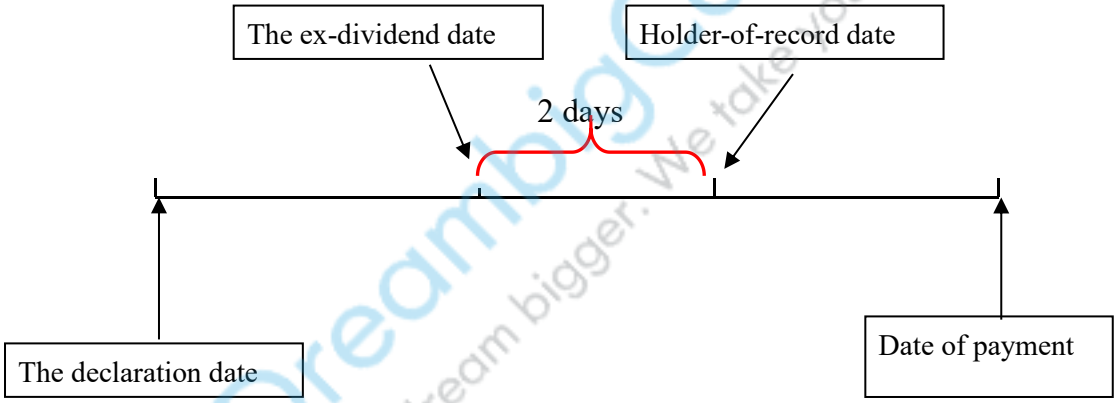
➢ $$Q_{BE} = \frac{fixed\ operating\ costs + fixed\ financial\ costs}{Price - Variable\ cost\ per\ unit}$$

➢ **考察方法：**直接计算

5.18 Types of Dividends

- Cash dividends
  - Reduces both the value of the company's assets and the market value of equity.
  - Comes in the form of:
    - ✓ Regular dividends (a portion of profits on a consistent schedule)
    - ✓ Special dividends (a one-time cash payment)
    - ✓ Liquidating dividends (distributes the proceeds when a company goes out)
- Stock dividends & stock splits
  - Both create more shares
  - A proportionate drop in the price per share
  - No effect on shareholder wealth
- **考察方法：**侧重于定义与概念

5.19 Dividend Payment Chronology



- **考察方法：**需要记清楚各个日期之间的先后顺序；ex-dividend date 是由交易所决定的，其他日期由公司决定

5.20 Share Repurchase Methods

- Three share repurchase methods:
  - Buy in the open market. （give the company the flexibility to choose the timing of the transaction)
  - Buy a fixed number of shares at a fixed price. (need to pay a premium)
  - Repurchase by direct negotiation. (need to pay a premium)
- Repurchase financed with company's excess cash
  - Reduce number of shares outstanding increase EPS
  - Reduce interest income and earnings decrease EPS
  - Compare earning yield and after-tax yield of company fund
- Repurchase financed with debt
  - Reduce number of shares outstanding->increase EPS
  - Incur interest cost and reduce earnings->decrease EPS
  - Compare earning yield and after-tax cost of debt
- The impact on the indicators due to cash dividend, stock dividend, stock split and repurchase (**post vs. pre**)

Indicator	Cash div.	Stock div.	Stock split	Repurchase
No. of shares	No changes	Increase	Increase	Decrease

Stock price	Ex-div	Ex-div (pro-rata)	Pro-rata decrease	Increase
EPS	No change	Decrease	Decrease	Uncertain
P/E	Decrease	No change	No change	Uncertain
Market value	Decrease by cash paid	No change	No change	Decreased by cash paid
Share owned by individual	No changes	Increase	Increase	Depends
Ownership value	Decrease in value but same in % of ownership	No changes	No change	Increase

5.21 **Liquidity measures**

- Primary sources of liquidity are the sources of cash it uses in its normal day-to-day operations. E.g., selling goods and services, collecting receivables, and generating cash from other sources such as short-term investments such as trade credit from vendors and lines of credit from banks, effective cash flow management of a firm's collections and payments .
- Secondary sources of liquidity include liquidating short-term or long-lived assets, negotiating debt agreements (i.e., renegotiating), or filing for bankruptcy and reorganizing the company.
- Drags on liquidity: when receipts lag, creating pressure from the decreased available funds.
  - Uncollected receivables
  - Obsolete inventory
  - Tight credit
- Pulls on liquidity: disbursements are paid too quickly or trade credit availability is limited, requiring companies to expand fund before the sales fund comes to cover the liability
  - Making payment early
  - Reduced credit limits
  - Limits on short-term lines of credit
  - Low liquidity positions
- **考察方法：**识别两种 Liquidity measures

5.22 **Payable Management**

- Typical terms on payables (trade credit) contain a discount available to those who pay quickly as well as a due date.
- Term s of "2/10 net 60"mean that 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 60days from the date of the invoice.
- $$\text{cost of trade credit}=(1+\frac{\text{discount}}{1\text{-discount}})^{365/\text{No. of days beyond discount period}}-1$$

  考察方法：计算

5.23 **Cash Management**

- $R_{mm}=(\frac{F-P}{P})(\frac{360}{t})=HPR \times (\frac{360}{t})$
- $BEY=(\frac{F-P}{P})(\frac{365}{t})=HPR \times (\frac{365}{t})$

5.24 Good corporate governance

- Good corporate governance practices seek to ensure that:
  - The firm acts lawfully and ethically in dealing with shareholders
  - Shareholders have a voice in governance
  - The Board of directors protects shareholder interests
  - The board acts independently form management
  - Proper procedures and controls cover management's day-to-day operations
  - The firm's financial, operating and governance activities are reported to shareholders in a fair, accurate and timely manner

5.25 Board of directors

- board --- independence
  - A majority of the board of directors is comprised of independent members;
  - The board meets regularly outside the presence of management;
  - Board members are not closely aligned with a firm supplier, customer, share-option plan or pension adviser;
- board --- qualification
  - Regularly attend meetings;
  - Are committed to shareholders;
  - Have other board experience;
  - Have served on board for more than 10 years;

5.26 **Voting rules**

- Confidential Voting：保密，can encourage unbiased voting
- Cumulative Voting:是一个好的公司治理
- Voting for other corporate Changes: 公司发生重大事件后，shareholders 需要进行投票
- Vote blocking： to prevents investors who wish to vote their shares from trading their shares during or prior to the annual meeting

5.27 **Takeover Defenses**

- Golden parachutes ◊ rich compensation package to target's top managers who lose their jobs as a result of takeover
- Poison pills ◊ give right to target's shareholders to buy the target's shares at a discount
- Greenmail ◊ allow the target to buy back its shares form the bidder at a premium to the market price

6 权益

6.1 Functions of the Financial Market

- Fulfill different entities' requirements
  - Save and borrow money, raise equity capital, manage risks, trade assets currently or in the future, and trade based on their estimates of asset values.
- Determine interest rates
  - Determine the returns (i.e., interest rates) that equate the total supply of savings with the total demand for borrowing.
- Allocate capital to its most efficient uses
  - The financial system allows the transfer of assets and risks from one entity to another as well as across time.

6.2 Intermediaries of Financial Market

- Brokers: help their clients buy and sell securities by finding counterparties to trades in a cost efficient manner.
- Block brokers: help with the placement of large trades. Typically, large trades are difficult to place without moving the market.
- Investment banks: help corporations sell common stock, preferred stock, and debt securities to investors.
- Exchanges: provide a venue whew traders can meet. Exchanges sometimes act as brokers by providing electronic order matching.
- Alternative trading systems (ATS): serve the same trading function as exchanges but have no regulatory function, are also known as electronic communication networks (ECNs) or multilateral trading facilities (MTFs).
- Dealers: trade by buying for or selling from their own inventory and thus provide liquidity in the market and profit primarily from the differences of buy and sell prices.
- Securitizers; pool large amounts of securities or other assets together and sell interests in the pool to other investors.
- Depository Institutions:
  - Absorb deposits by paying interest on customer deposits
  - Provide transaction services on one hand, and then make loans with the deposits on the other hand.
- Insurance companies: collect insurance premiums in return for providing risk reduction to the insured.
- Arbitrageurs: are intermediaries who seek to gain certain return without bearing any risk.
- Clearinghouses: act as buyers when customers want to sell assets and as sellers when customers want to buy assets, and thus limit counterparty risk.
- Custodians: improve market integrity by holding client securities and preventing their loss due to fraud or other events that affect the broker or investment manager.

6.3 Positions an investor can take in an asset

- Long Position
  - An investor who owns an asset, or has the right or obligation under a contract to purchase an asset, is said to have a long position.
  - Benefit form an increase in the price

- Short Position
  - For a short-sale, the procedure is as below:
    - ✓ Borrow the stock and simultaneously sell it through your broker in the market.
    - ✓ Return the stocks upon your brokers request
    - ✓ Maintain the proceeds of short-sales as collateral.
  - Benefit from a decrease in the price
  - Unlike a long position, the potential loss of a short sale is unlimited
  - Payment-in-lieu: the received dividends and interests must be paid back to the investor who lent the stock
  - short rebate rate
    - ✓ The short seller must deposit the proceeds of the short sale as collateral
    - ✓ The broker earns interest on these funds and may return a portion of this interest to the short seller at a rate referred to as the short rebate rate.
    - ✓ If the security is difficult to borrow, short rebate rate may be lower or negative.
- Leveraged Positions
  - Definition: An investor is said to be take leveraged positions if he borrowed funds to purchase an asset.
  - Buy on margin: Investors who use leverage to buy securities by borrowing from their brokers are said to buy on margin and the borrowed funds are referred to as a margin loan.
  - The interest rate paid on the funds is the call money rate
  - leverage ratio:
    - ✓ The leverage ratio of a margin investment is the value of the asset divided by the value of the equity position.
  - Margin Requirement: the required equity position is called the margin requirement.
    - ✓ Initial Margin: a minimum amount of equity at the time of a new margin purchase
    - ✓ Maintenance Margin: is the investor's required equity position in the account.
    - ✓ Margin Call: if an investor's margin account balance falls below the maintenance margin, the investor will receive a margin call and will be required to either liquidate the position or bring the account back to its maintenance (minimum) margin requirement
    - ✓ Margin Call Price for a Long Position: $$P_L^{'} = P_0\left(\frac{1-IM}{1-MM}\right)$$

6.4 Orders

- Execution instructions: specify how to trade
  - Market orders: execute the trade immediately at the best possible price
  - Limit orders: places a minimum execution price on sell orders and a maximum execution price on buy orders.
  - Hidden orders: only the broker or exchange knows the trade size

- Iceberg orders: some of the trade is visible to market

➢ Validity instructions: specify when the order can be filled
- Day orders: expire if unfilled by the ending of the trading day
- Good-till-cancelled orders: last until they are filled
- Good-on-close orders: only filled at the end of the trading day
- Stop orders: not executed unless the stop price has been met
  - ✓ Stop-buy is entered with at stop above the current market price, when market price down to stop price or lower, triggers to sell.
  - ✓ Stop-sell is entered with at stop below the current market price, when market price up to stop price or higher, triggers to buy.

➢ Clearing instructions: specify how to clear and settle the trade

6.5 Classification of markets

➢ Primary vs. Secondary markets
- Primary market: is the market where newly issued securities are sold. Newly issued securities involve:
  - ✓ IPO (initial public offerings): first-time issues by firms whose shares are not currently publicly traded.
  - ✓ Seasoned offerings (secondary issues): new shares issued by firms whose shares are already trading in the marketplace.
- Secondary market: is the market where the securities are traded.

➢ Money vs. Capital markets
- 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.

➢ Traditional vs. Alternative markets
- Traditional investment markets: refer to markets for debt and equity.
- Alternative markets: refer to markets for hedge funds, commodities, real estate, collectibles, gemstones, leases, and equipment.

6.6 Difference between underwritten offering and best efforts

Underwritten offering	Best Efforts
Obligated to buy the unsold portion	**Not obligated to buy the unsold portion**
Investment bank would prefer that the price be set low enough to gain more profit	**Investment bank sets the issue price as high as possible to raise the most funds for the issuer**

6.7 Order-Driven Market

➢ Two sets of rules are used in these markets:
- Order matching rules: establish an order precedence hierarchy.
  - ✓ Price priority: trades with the highest bid (buy) and lowest ask (sell) prices are traded first, this is so-called price priority.
  - ✓ Secondary precedence rule: if orders are at the same prices, the earliest arriving orders are traded first.
- Trade pricing rules: are used to determine the price after orders are created using order matching rules.

- ✓ Under the uniform pricing rule, all orders trade at the same price, which is the price that results in the highest volume of trading.
- ✓ The discriminatory pricing rule uses the limit price of the order that arrived first as the trade price.

6.8 Quote-Driven Market

- Quote-driven market is also referred to as a dealer market, a price-driven market or an over-the-counter market. Dealers post bid and ask prices.
- Numerous dealers compete against each other to provide the highest bid prices when investors are selling and the lowest asking price when investors are buying stock.

6.9 Brokered Markets

- Brokers trade with the counterparty they find.
- This service is especially valuable when the trader has a security that is unique or illiquid.

6.10 Characteristics of a well functioned financial Market

- Complete markets:
  - Investor can save at a fair rate of return
  - Creditworthy borrowers can obtain capital.
  - Hedgers can manage risks
  - Traders can acquire needed assets.
- Operational efficiency: Trading costs are low.
- Informational efficiency: Prices reflect fundamental information quickly.
- Allocational efficiency: Capital is allocated to its most productive use.

6.11 Weighting schemes for stock indexes

- Price-Weighted Index

$$\text{price-weighted index}=\frac{\text{sum of stock prices}}{\text{number of stocks in index adjusted for splits}}$$

- Equal-Weighted Index: need to be rebalanced most frequently, so it creates high transactions costs

$$\text{equal-weighted index}=\frac{\text{sum of stock returns}}{\text{number of stocks}}\times\text{initial index value}$$

- Market Capitalization-Weighted Index

$$\text{Current index value}=\frac{\text{current total market value of index stocks}}{\text{base year total market value of index stocks}}\times\text{base year index value}$$

- A Float-Adjusted Market Capitalization-Weighted Index
- Fundamental weighting

6.12 Rebalancing and Reconstitution

- Rebalancing:
  - is used to adjusting the weights of securities in a portfolio to their target weights since price changes may affect the weights of securities used to calculate the indexes
  - Rebalancing is done on a periodic basis, usually quarterly.
- Reconstitution:

- Index reconstitution refers to periodically adding and deleting securities that make up an index.
- Securities are deleted if they no longer meet the index criteria and are replaced by other securities.

6.13 Factors affect the degree of market efficiency

- Number of market participants
  - The larger the number of investors, analysts, and traders who follow an asset market, the more efficient the market.
- Availability of information
  - The more information is available to investors, the more efficient the market.
  - Access to information should not favor one party over another.
- Impediments to trading
  - Arbitrage refers to buying an asset in one market and simultaneously selling it at a higher price in another market.
  - Impediments to arbitrage (high transactions costs or lack of information) will limit arbitrage activity and allow some price inefficiencies to persist.
- Transaction and information costs
  - To the extent that the costs of information, analysis, and trading are greater than the potential profit from trading miss-valued securities, market prices will be inefficient.

6.14 Three forms of market efficiency

- The weak-form EMH:
  - Assumes that current stock prices fully reflect all security-market information such as historical sequence of price, rate of return, trading volume data, and other market generated information.
  - An investor cannot achieve positive risk-adjusted returns on average by using technical analysis.
- The semi-strong form EMH: assumes that security prices adjust rapidly to the release of all public information, which means current stock prices fully reflect all public information.
  - Besides market information, public information also includes all non-market/fundamental information
  - An investor cannot achieve positive risk-adjusted returns on average by using fundamental analysis.
- The strong-form EMH: assumes that stock prices fully reflect all information from public and private sources.
  - All information is cost-free and available to everyone at the same time.
  - No group of investors has monopolistic access to information relevant to the formation of prices, and none should be able to consistently achieve positive abnormal returns.

6.15 Implications of each form of market efficiency

- Technical analysis: seeks to earn abnormal profit by using historical price and volume data
  - A way to test the weak-form market efficiency.

- Fundamental analysis: seeks to earn abnormal profit based on public information.
  - A way to test the semi-strong form of market efficiency.

6.16 Market Anomalies

- Anomalies in time- series data
  - Calendar anomalies
    - ✓ The January effect or turn-of-the-year effect is the finding that during the first five days of January, stock returns, especially for small firms, are significantly higher than they are the rest of the year.
  - Momentum anomalies
    - ✓ The overreaction effect refers to the finding that firms with poor stock returns over the previous three or five years (losers) have better subsequent returns than firms that had high stock returns over the prior period.
- Anomalies in cross-sectional data
  - Size effect: This test indicates that stocks of small-sized firms tend to outperform stocks of large-sized firms
  - Value effect: refers to the finding that value stocks [those with lower price-to-earnings (P/E), lower market-to-book (M/B), and higher dividend yields] have outperformed growth stocks (those with higher P/E, higher M/B, and lower dividend yields)
- Other anomalies
  - Closed-end investment funds: The shares of closed-end investment funds trade at prices that sometimes deviate from the net asset value (NAV) of the fund shares, often trading at large discounts to NAV.
  - Earnings announcements: The anomaly is that the adjustment process does not occur entirely on the announcement day.
  - Initial public offerings: the long-term performance of IPO shares as a group is below average.
  - Economic fundamentals: Research has found that stock returns are related to known economic fundamentals such as dividend yields, stock volatility, and interest rates. However, we would expect stock returns to be related to economic fundamentals in efficient markets.

6.17 Behavioral biases

- Loss aversion: refers to the tendency for investors to be more risk averse when faced with potential losses and less risk averse when faced with potential gains.
- Overconfidence bias: explains that investors or analysts are overconfident in their earning forecasts which result in the overestimation of growth, good news.
- Representativeness: Investors assume good companies or good markets are good investments.
- Gambler's fallacy: Recent results affect investor estimates of future probabilities.
- Mental accounting: Investors classify different investments into separate mental accounts instead of viewing them as a total portfolio.
- Conservatism: Investors react slowly to changes.
- Disposition effect: Investors are willing to realize gains but unwilling to realize losses.
- Narrow framing: Investors view events in isolation.

6.18 Industry Life Cycle

- Embryonic stage
- Growth stage
- Shakeout stage
- Mature stage
- Decline stage

6.19 Industry Concentration

- Concentration Ratio
  - the joint market share of the leading N firms in the industry
- Herfindahl Index

$$H=M_1^2+M_2^2+\cdots+M_N^2=\sum_{i=1}^{N}M_i^2$$

6.20 Competitive Advantage

- Analysis framework developed by Michael Porter delineates five forces that determine industry competition:
  - Rivalry among existing competitors. Rivalry increases when many firms of relatively equal size compete within an industry.
  - Threat of new entrants. Industries that have significant barriers to entry will find it easier to maintain premium pricing.
  - Threat of substitute products. Substitute products limit the profit potential of an industry.
  - Bargaining power of buyers. Buyers' ability to bargain for lower prices or higher quality influences industry profitability.
  - Bargaining power of suppliers. Suppliers' ability to raise prices or limit supply influences industry profitability.

6.21 Valuation model of a preferred stock

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

6.22 Dividend discount Model (DDM)

- ***One-Year Holding Period***

$$V_j=\frac{D_1}{(1+k)}+\frac{P_{j1}}{(1+k)}$$

- ***Two-Year Holding Period***

$$V_j=\frac{D_1}{(1+k)}+\frac{D_2}{(1+k)^2}+\frac{P_{j2}}{(1+k)^2}$$

- ***The General DDM***

$$V_j=\frac{D_1}{(1+k)}+\frac{D_2}{(1+k)^2}+\cdots+\frac{D_\infty}{(1+k)^\infty}=\sum_{t=1}^{n}\frac{D_t}{(1+k)^t}$$

- ***Gordon growth model***

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

- ***Multiple-Stage Dividend Growth Models***

$$V_0 = \frac{D_1}{(1+k_e)} + \frac{D_2}{(1+k_e)^2} + \ldots + \frac{D_n}{(1+k_e)^n} + \frac{P_n}{(1+k_e)^n}$$

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

- ***Other variable parameters***
  - The required rate of return $k = RFR_{nominal} + \beta(R_M - RFR_{nominal})$
  - g=sustainable growth rate = b * ROE
  - b = retention ratio = 1 – dividend payout rate

6.23 Discounted cash flow models

- FCFE=net income + depreciation-increase in working capital-fixed capital investment (FCInv)-debt principal repayments + new debt issues
- FCFE = cash flow from operations - FCInv + net borrowing
- $$V_0 = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1+k_e)^t}$$

6.24 Multiplier based on fundamentals

- According to infinite period DDM

$$P_0 = \frac{D_1}{k-g}$$

- Justified P/E: Assume we divide both sides of the equation by E1 (expected 12-month earnings), the equation changes to:
  - Leading P/E: Based on expected earnings next period

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

  - Trailing P/E: Based on actual earnings for the previous period

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

6.25 Enterprise value Model

- EV = market value of common stock + market value of preferred equity + market value of debt + minority interest – cash and short-term investments
- Advantage
  - Useful for comparing firms with different degrees of financial leverage
  - EBITDA is useful for valuing capital-intensive business EB
  - EBITDA is usually positive even when EPS is not.

- Disadvantages
  - Market value of debt is often not available.
  - Market value of similar debt can be used
  - Book value of debt can be used

6.26 Asset-based Model

- Applying asset-based models is especially problematic for a firm that has a large amount of intangible assets, on or off the balance sheet.
- Asset-based model valuations are most reliable when the firm has:
  - primarily tangible short-term assets
  - assets with ready market values
  - The firm will cease to operate and is being liquidated.
- Asset-based models are often used to value private companies

6.27 Comparison of the three major valuation methods

	Advantage	Disadvantage
Discounted cash flow models	➢ **They are based on the fundamental concept of discounted present value and are well grounded in finance theory.** ➢ **They are widely accepted in the analyst community.**	➢ **Their inputs must be estimated.** ➢ **Value estimates are very sensitive to input values.**
Price multiples on comparable	➢ **Evidence that some price multiples are useful for predicting stock returns.** ➢ **Price multiples are widely used by analysts.** ➢ **Price multiples are readily available.** ➢ **They can be used in time series and cross-sectional comparisons.** ➢ **EV/EBITDA multiples are useful when comparing firm values independent of** ➢ **capital structure or when earnings are negative and the P/E ratio cannot be used.**	➢ **Lagging price multiples reflect the past.** ➢ **Price multiples may not be comparable across firms if the firms have different size, products, and growth.** ➢ **Price multiples for cyclical firms may be greatly affected by economic conditions at a given point in time.** ➢ **A stock may appear overvalued by the comparable method but undervalued by a fundamental method, or vice versa.** ➢ **Different accounting methods can result in price multiples that are not comparable across firms, especially internationally.** ➢ **A negative denominator in a price multiple results in a meaningless ratio. The P/E ratio is especially susceptible to this problem.**

price multiple valuations based on fundamentals	➢ **They are based on theoretically sound valuation models.** ➢ **They correspond to widely accepted value metrics.**	➢ **Price multiples based on fundamentals will be very sensitive to the inputs (especially the k-g denominator).**
Asset-based models	➢ **Provide floor values** ➢ **Most reliable when the firm has primarily tangible short-term assets, assets with ready market values, or when the firm is being liquidated** ➢ **Useful for valuing firms that report fair values**	➢ **Market values are difficult to obtain** ➢ **Market values are different than book values** ➢ **Inaccurate when firms have a high proportion of intangible assets or future CFs not reflected in asset values** ➢ **Difficult to value during periods of hyperinflation.**

7 固定收益

7.1 Affirmative VS negative covenants

- Affirmative covenants : the borrower promises to do
  - To pay interest and principal on timely basis.
  - To pay all taxes and other claims when due.
  - To maintain all properties used and useful in the borrower's business in good condition and working order.
  - Submit periodic reports.
- Negative covenants : prohibitions on the borrower
  - The company can't sell assets that have been pledged as collateral;
  - The company can't claim that the same assets back several debt issues simultaneously;
  - The company can't borrow additional money unless certain financial conditions are met.

7.2 Types of Debt Securities

- Zero-coupon bonds: no periodic coupon payments; always be traded at a discount.
- Accrual bonds: Coupon interest accrues at a compound rate until maturity
- Deferred coupon bonds: interest payments are deferred for a specified number of years.
- Step-up notes: have a coupon rate that increases over time
- Floating-rate Securities: coupon interest payment over the life of the security vary based on a specified interest rate or index

7.3 Floating-rate Securities

- The coupon rate determined at the coupon reset date is the rate that the issuer promises to pay at the next coupon date
  - New coupon rate = reference rate +/- quoted margin
- Cap and floor
  - The upper limit is called the cap.
  - The lower limit is called the floor.
  - When a floating-rate security has both a upper limit and a lower limit, the feature is called a collar.
- **Inverse floaters** (also called ***reverse floaters***) have coupon rates that move in the opposite direction from the change in the reference rate.
  - When the reference rate increases, the coupon rate decreases and vice versa.
  - The coupon rate of a inverse floater is computed as:

$$\text{Coupon rate} = K - L \times (\text{Reference rate})$$

7.4 Accrued interest, full price and clean price

- Accrued Interest: the interest received by the seller when a bond trades between coupon dates.
- Clean Price: the agreed upon price of the bond.
- Full Price (or dirty price): the amount that the buyer pays to the seller, which equals the clean price plus any accrued interest.
- Full Price = Clean Price +Accrued Interest

7.5 Provisions for redemption and retirement of bonds

- **Bullet Bond:** Pay only interest until maturity (non-amortizing).

- **Amortizing Securities:** Make periodic interest and principal payments over the life of the bond.
  - Mortgage-backed securities and asset-backed securities often use this structure.
- **Call Provisions:** give the issuer the right to retire all or a part of an issue prior to maturity
  - Call protection
- **Refunding provisions:** allow the issuer to retire an existing bond through the sale of a new bond, usually at a lower interest rate.
- **Sinking fund provisions** require the issuer to retire a specified portion of the principal periodically over the life of the bond.
  - Cash Payment (used when bond is sold at premium)
    - ✓ issuer deposit cash to trustee, retire bond (selected by lottery) at par by trustee.
  - Delivery of Securities (used when bond is sold at discount)
    - ✓ issuer buy bonds in open market (total par value=amount to be retired), deliver them to trustee.
- **Prepayment Option:** give the issuer the right to accelerate the principal repayment on a loan.
- **Accelerated Sinking Fund Provision** allows the issuer the choice of retiring more than the amount of bonds specified in the sinking fund requirement.
- **Nonrefundable vs. Noncallable Bonds**
  - Nonrefundable Bonds prohibit the call of an issue using the proceeds from a lower coupon bond issue.
    - ✓ A bond may be callable but not refundable.
  - Noncallable Bonds are more common than nonrefundable bonds.
    - ✓ Call protection, is more powerful than the refunding protection in protecting premature and unwanted redemptions .

7.6 Embedded options favor the issuers:

- Call option.
  - If interest rates fall
    - ✓ The issuer can retire the bond paying high coupon rate, and replace it with lower coupon bonds.
    - ✓ When the bond is called, the proceeds can only be reinvested at a lower interest rate.
- The prepayment option.
- Accelerated sinking fund provision.
- The cap on a floater.

7.7 Embedded options favor the bondholders:

- Conversion provisions.
- The put option.
- The floor on a floater.

7.8 Margin Buying and Repurchase Agreements

- **Margin Buying Arrangement**:
  - Borrowing funds from a broker or a bank to purchase securities (collateral: the securities themselves).
  - The margin amount is regulated by the Federal Reserve.

- **Repurchase (repo) Agreement**
  - An institution sells a security with a commitment to buy it back at a later date at a specified price.
  - Repo rate: The repurchase price is greater than the selling price and accounts for the interest charged by the buyer.
    - ✓ The interest rate implied by the selling piece and the repurchase price
    - ✓ Repo rate is the annualized percentage difference between the two prices.
    - ✓ Repo rate is customarily less than the rate a bank or brokerage would charge on a margin loan.

7.9 Risks Associated with Bond

- **Interest Rate Risk:** the effect of changes in the prevailing market rate of interest on bond values.
- **Yield Curve Risk:** arises from the possibility of changes in the shape of the yield curve.
- **Call Risk:** arises from the fact that when interest rate fall, a callable bond investor's principal may be returned and must be reinvested at the new lower rates.
- **Prepayment Risk:** is similar to call risk. Prepayments are principal repayments in excess of those required on amortizing loans.
- **Reinvestment Risk:** the fact that when market rates fall, the cash flows from fixed-income securities must be reinvested at lower rates, reducing the returns an investor will earn.
- **Credit Risk**: the risk that the creditworthiness of a fixed-income security's issuer will deteriorate, increasing the required return and decreasing the security's value.
- Liquidity **Risk:** has to do with the risk that the sale of a fixed-income security must be made at a price less than fair market value because of a lack of liquidity for a particular issue.
- **Exchange-Rate Risk:** arises from the uncertainty about the value of foreign currency cash flows to an investor in terms of his home-country currency.
- Inflation **Risk**: the uncertainty about the amount of goods and services that a security's cash flows will purchase.
- **Volatility Risk:** is present for fixed-income securities that have embedded options. The effect of changes in interest rate volatility on values of bonds with embedded options.
- **Event Risk:** encompasses the risks outside the risks of financial markets, such as the risks posed by natural disasters and corporate takeovers.
- **Sovereign Risk:** changes in governmental attitudes and policies toward the repayment and servicing of debt.

7.10 Relationship of Coupon rate, yield, price

Premium	Coupon rate > Required market yield, bond price> par value
Par	Coupon rate = Required market yield, bond price = par value
Discount	Coupon rate < Required market yield, bond price < par value

7.11 Maturity, Coupon, and Embedded Options affect the Bond's Interest Rate Risk

Maturity	The price of the bond with longer maturity will change more for a given change in yield.	Higher duration

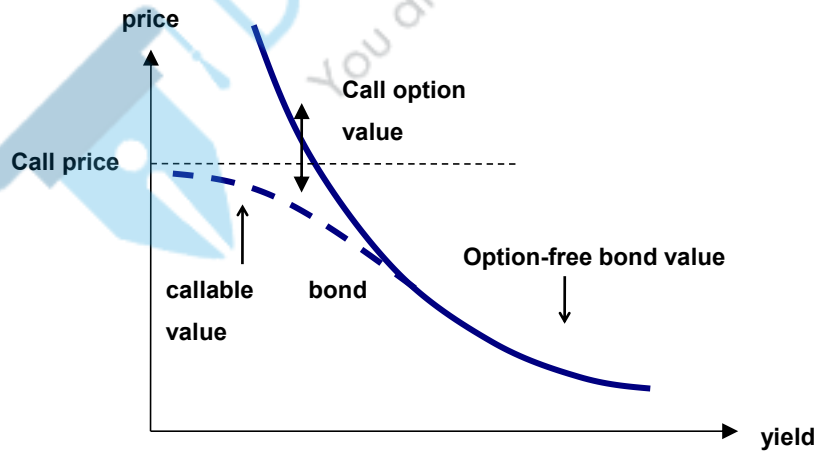
Coupon rate	The price of the bond with higher coupon rate will change less for a given change in yield.		Lower duration
Embedded options（callable & putable）	call	The value of bond with embedded options is less sensitive to interest rate changes.	Lower duration
	put		

7.12 Floating-rate security

- Floating-rate securities have less interest rate risk, but still have it.
  - Coupon rate in line with current market yield.
  - Time Lag: there is a lag between the time when the market yield changes and coupon rate is reset. The greater the gap, the greater the bond price fluctuation.
- Price of floating rate security differs from par value.
  - Fixed Margin: the required margin (non-constant) does not match quoted margin (constant).
  - Caps: the reference rate ↑ → the cap rate reached →market yields ↑ →floater's price ↓

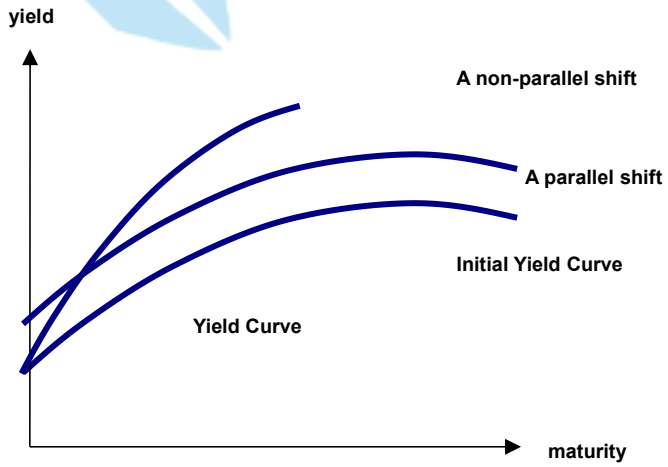
7.13 Interest risk in Callable Bond

- $V_{callable} = V_{pure} - V_{call}$
  - If r ↓, pure bond price increases more than callable.
  - If r ↑, value of the embedded call option ↓, callable bond value fall less than comparable option free bond
  - In general, the value of a callable bond is less sensitive to interest rate changes than an otherwise identical option-free bond.



7.14 Yield Curve Risk

- **Yield curve:** the graphical depiction of relationship between yield and maturity
  - Portfolio duration: the approximate percentage change in portfolio value for a 1% change in yield.
  - Portfolio duration is appropriate for parallel shifts of the yield curve.
  - Nonparallel shift: the yields on different bonds in a portfolio can change by different amounts, and duration alone can't capture the effect of a "yield change" on the value of the portfolio.
- **Yield Curve Risk:** decreases in portfolio value from changes in the shape of the yield curve. (i.e., non-parallel shifts, key rate duration)



7.15 Reinvestment Risk

- **Reinvestment Risk:** Risk for proceeds from the payment of interest and principal (i.e. scheduled payments, called proceeds, and principal prepayments).
- A security has more reinvestment risk when:
  - The coupon is higher.
  - It has a call feature.
  - It's an amortizing security.
  - It contains a prepayment option.
- Prepayable amortizing securities expose investors to greater reinvestment risk than non-amortizing securities.
- Reinvestment risk is minimized with low or zero-coupon bond issues or when time horizons are short.

7.16 Types of Credit Risk

- Default Risk: the risk that a bond will fail to make promised/scheduled payments.
- Credit Spread Risk: an increase in credit spread increases the required yield and decreases the price of a bond.
- Downgrade risk: credit rating agency will lower a bond's rating, then the yield required will increase and price of bond will decrease.

7.17 Credit Ratings

- Give bond purchasers an indication of the risk of default.
- It's an indication of the relative probability of default across the range of companies and bonds.

investment grade	AAA, AA, A and BBB	
speculative (junk bond or high yield bond)	normal speculative bond	BB and B
	highly speculative	CCC, CC and C
	currently in default	D

7.18 Sectors of the bond market

Bond	Both side of transaction	Currency	Example
Domestic bond	Resident-Resident	Local Currency of Issuance	

Foreign bond	Non-Resident-Resident	Local Currency of Issuance	Yankee bonds & Bulldog bonds
Eurobond	Non-Resident-Non-Resident	A Third Country Currency	Bond which is denominated by US dollar and issued in Japan by Chinese.

7.19 U.S. Treasuries

- Features: Issued by central government, free of credit risk and volatility risk.
- Methods of Distributing

Methods	Details	Auction cycle
Regular Auction Cycle/Multiple-Price Method	Winning bidders are allocated securities at the yield (price) they bid.	Regular auction cycle
Regular Auction Cycle/Single-Price Method	Winning bidders are awarded securities at the lowest price (highest yield) accepted by the government.	Regular auction cycle
Ad Hoc Auction Method	Government announces auctions when prevailing market conditions appears favorable.	Only at the time the amount and the amount to be auctioned.
Tap Method	Additional bonds of a previously outstanding bond issue are auctioned.	Government announces periodically.

7.20 Treasury Inflation-Protected Securities（TIPS）

- Structured to protect investors from inflation.
- Auctioned 5-, 10- and 20-year TIPS.
- Pay semiannual coupons.
- Their principal is indexed to inflation.
- Coupons fluctuate with inflation.
- At maturity:
  - If adjusted par value (per bond) is greater than $1,000 at maturity, the holder receives the adjusted par value as the maturity payment.
  - If the adjusted par value is less than $1,000 (due to deflation), holders receive $1,000 at maturity as this is the minimum repayment amount.
- TIPS coupon payment=inflation-adjusted par value $\times \frac{\text{stated coupon rate}}{2}$

7.21 Treasury strips

- **Treasury Strips**: zero coupon securities of various maturities.
  - Coupon Strips (denoted as ci): created from coupon payments stripped from the original security.
  - Principal Strips: bond (maturities of 20-30years) and note (maturities of 2.3.5 and 10 years) principal payment with the coupons stripped off.

7.22 Mortgage-Backed Securities

- **Mortgage passthrough securities:** created when one or more holders of mortgages form a collection of mortgages and sell shares or participation certificates in the pool.

- **Collateralized Mortgage Obligations:** created from mortgage passthrough certificates and referred as derivative mortgage-backed securities.
- **Stripped MBS:** prepayment affect PO and IO differently.
  - If r ↓, prepayment risk ↑, benefit to PO, not to IO.

7.23 Motivation for Creating CMO

- Redistribute the prepayment risk inherent in mortgage passthrough securities.
- Create securities with various maturity ranges.

7.24 Municipal bond

- **GO (general obligation)/Tax-Backed Debt :** Support by taxing power of local government
  - Almost no credit risk
  - Require voter approval
  - Types
    - ✓ Limited tax GO debt: a statutory limit on taxes that may be raised to pay off the obligation.
    - ✓ Unlimited tax GO debt: secured by the full faith and credit of the borrower, backed by its unlimited taxing authority. (the more secure form)
    - ✓ Double barreled bonds: backed by the issuing authority's taxing power& additional resources.
    - ✓ Appropriation-backed obligations: states sometimes act as a back up source of funds for issuers during times of shortfall. (not legally binding)
    - ✓ Debt supported by public credit enhancement programs possess a guarantee by the state or federal government
- **Revenue Bonds**
  - Supported only through revenues generated by projects.
  - Involve more risk, provide higher yield.
- **Insured Bonds:** carry the guarantee of a third party to ensure the payments.
- **Prerefunded Bonds:** treasury securities are purchased to ensure the payments.

7.25 Secured bonds and unsecured bonds

- Secured bonds: backed by the pledge of asset/collateral.
- Unsecured debt: not backed by any pledge of specific collateral.

7.26 Credit enhancement for corporate bonds

- Third-party guarantee
- Letter of credit
- Bond insurance

7.27 Characteristics of a regular Corporate bond offering

- Are sold all at once
- Are sold on a firm-commitment basis
- Consist of bonds with a single coupon rate and maturity

7.28 Medium-term notes

- Differ from a regular corporate bond offing
- Various maturities, rating from 9 months to 100 years
- Offering is done on a best-efforts basis

7.29 Structured notes: issuer combines a typical bond or note with a derivative

7.30 **Commercial paper:** short term, unsecured, low rate, exempt from registration, directly placed (sold directly by issuer) or dealer placed (sold to investor through agents/brokers).

7.31 **Negotiable CDs：** similar to bank deposits, traded in the secondary market, and are backed by assets.

7.32 **Bankers Acceptances：** guaranteed by a bank that a loan will be repaid.

7.33 Collateralized debt obligation CDO

- A debt instrument where the collateral for the promise to pay is an underlying pool of other debt obligations and even other CDOs.
- Tranches of the CDO are created based on the seniority of the claims to the cash flows of the underlying assets.

7.34 Basic theories of the terms of structures of interest rate

		Description	Shapes
Unbiased expectation theory	Pure expectation theory	The yield for a particular maturity is an average of short-term rates that are expected in the future.	Upward slope: short-term rates are expected to rise Downward slope: short-term rates are expected to fall Flat yield: short-term rates are expected to remain the same
Biased expectation theory	Liquidity theory	In addition to expectations about future short-term rates, investors require a risk premium for holding longer term bonds.	Upward slope: either rising expected future rates or rates remain/fall but liquidity premium is added Downward slope: short-term rates are expected to fall
	Market segmentation theory	Investors and borrowers have preferences for different maturity ranges. The supply and demand for bonds determine equilibrium yields for the various maturity ranges.	No specific linkage among the yields at different maturities.

7.35 Spot rate

- **Spot Rates**: the appropriate discount rates for individual future payments.
  - Arbitrage-Free Treasury Spot Rates: the spot rates for different time periods that correctly value the cash flows from a Treasury bond.

7.36 Measuring Yield Spread

- Absolute yield spread = yield on the higher-yield bond — yield bond on the lower-yield bond
- $\text{Relative yield spread} = \dfrac{\text{absolute yield spread}}{\text{yield on the benchmark bond}}$
- $\text{Yield ratio} = \dfrac{\text{subject bond yield}}{\text{benchmark bond yield}}$

7.37 Embedded Options Affecting Yield Spreads

- Yield spreads are higher for the callable bond.
- Yield spreads are lower for the putable bond.

7.38 Liquidity or issue-size affects yield spread

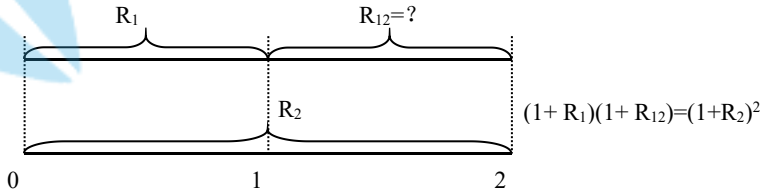
- Bonds that have less liquidity have higher spreads to Treasuries.
- Larger issues normally have greater liquidity and lower yield spread.

7.39 After-tax yield of a taxable bond vs. tax-equivalent yield of a tax-exempt bond

- **Tax-equivalent yield**= tax free yield/(1-marginal tax rate)
- **After-tax yield**= taxable yield × (1-marginal tax rate)

7.40 Bond Valuation

- **Valuation with a Single yield**
  - $P = \sum_{t=1}^{n} \frac{C_t}{(1+r)^t} + \frac{B}{(1+r)^n}$
  - Bond values and bond yields are inversely related as showed in price-yield curve.
- **the value of a zero-coupon bond**
  - $\text{bond value} = \frac{\text{maturity value}}{(1+\text{i})^{\text{number of years}\times 2}}$
- **Arbitrage-Free Bond Valuation**
  - Discount each cash flow using a discount rate specific to the maturity of each cash flow;
  - Compare the obtained present value to the market price to determine arbitrage opportunities;
  - STRIPS program helps to force the bond price toward equality with their arbitrage-free values.
  - Use principal to calculate forward rate



7.41 Current yield

- $\text{current yield} = \frac{\text{annual cash coupon payment}}{\text{bond price}}$

7.42 Yield to Maturity

- $bond\ price = \frac{CPN_1}{(1+YTM/2)} + \frac{CPN_2}{(1+YTM/2)^2} + \cdots + \frac{CPN_{2N} + Par}{(1+YTM/2)^{2N}}$

Bond Selling at:	Relationship

Par	coupon rate = current yield = yield to maturity
Discount	coupon rate＜current yield＜yield to maturity
Premium	coupon rate＞current yield＞yield to maturity

7.43 Yield measures for fixed-rate bond

- **Yield to call (put)** is calculated as a YTM but with the number of periods until the call (put) price substituted for the number of periods to maturity and the maturity value.
- **Yield to Worst**: the worst yield outcome of any that are possible given the call provisions of the bond.
- **Yield to Refunding**: is similar to YTC. Yield to refunding would use the call price, but the date is when refunding protection ends.
- **Cash Flow Yield**: a monthly internal rate of return based on a presumed prepayment rate and the current market price of a mortgage-backed or asset-backed security.
  - A monthly internal rate of return
  - Usually used for mortgage-backed securities and asset-backed securities
  - BEY = $[(1+\text{monthly CFY})^6 - 1] \times 2$
- **Bond Equivalent Yield**
  - A Semiannual YTM or Semiannual-Pay YTM
  - 2×the Semiannual Discounted Rate
  - BEY of an annual-pay bond = $[(1+\text{annual YTM})^{1/2} - 1] \times 2$
  - convert semiannual to annual EAR=$(1+\text{BEY}/2)^2-1$

7.44 Reinvestment income

- Required reinvestment income=purchase price×$(1+r_{MRT})^N$-maturity value-coupon

- Other things equal, a bond's reinvestment risk will increase with:
  - Higher Coupons
  - Longer Maturities
- Reinvestment rate>YTM→ Realized return>YTM
- Reinvestment rate<YTM→ Realized return<YTM

7.45 Nominal spread, Z-spread and OAS

	Description	Character
Nominal spread	= Bond yield to maturity – yield on a comparable-maturity government treasury security $P_{market}=\frac{CF_1}{(1+R+N)^1}+\frac{CF_2}{(1+R+N)^2}+..$	Use a single interest rate to discount each cash flow.
Z-spread	$P_{market}=\frac{CF_1}{(1+R_1+Z)^1}+\frac{CF_2}{(1+R_2+Z)^2}+...$	Assume the interest rate volatility is zero.
OAS	OAS=Z-spread – Option cost $P_{market}=\frac{CF_1}{(1+R_1^*+OAS)^1}+\frac{CF_2}{(1+R_2^*+OAS)^2}+...$	

7.46 Spot Rates, and Forward Rates

- Relationship Between Forward Rates and Spot Rates

$$(1+S_T)^T = (1+{}_1f_0)(1+{}_1f_1)\ldots(1+{}_1f_{(T-1)})$$

- Valuation Using Forward Rates

$$bond\ value = \frac{CF_1}{(1+{}_1f_0)} + \frac{CF_2}{(1+{}_1f_0)(1+{}_1f_1)} + \ldots \frac{CF_n}{(1+{}_1f_0)(1+{}_1f_1)\ldots(1+{}_1f_{n-1})}$$

7.47 Measurement of Interest Rate Risk

- Full Valuation
  - Use valuation model to estimate what the price of the bonds will be in each interest rate scenario.
  - Function: to assess the exposure of a bond or portfolio to interest rate changes to evaluate any scenario (measuring interest rate risk) including bonds that embedded options.
  - Limitation: time consuming
- Duration/Convexity Approach
  - Provides an approximation of the actual interest rate sensitivity of a bond or bond portfolio.
  - The duration-convexity approach is appropriate only for estimating the effects of parallel yield curve shifts.

7.48 Duration

- $\text{Macaulay duration} = \sum_{t=1}^{n} \frac{t \times \text{PVCF}_t}{\sum \text{PVCF}_t (= P_0)}$
- $\text{Modified duration} = \frac{\text{Macaulay duration}}{1+\text{periodic market yield}}$
- $\text{Effectiv Duration} = \frac{V^- - V^+}{2\Delta y}, \frac{1}{V_0}$
- Portfolio duration = $w_1D_1 + w_2D_2 + \ldots\ldots + w_nD_n$
- PVBP = MD $\times P_0 \times 0.0001$ (1bp)=DV_{01}

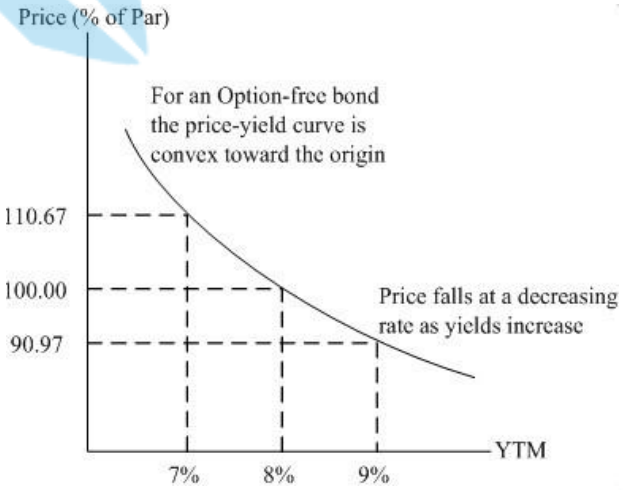
7.49 Convexity

- A bond's approximate price change based on duration and convexity.

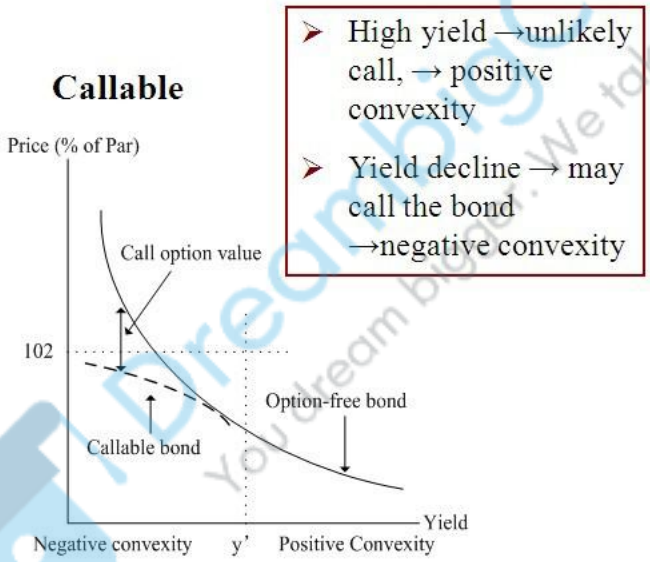
$$\frac{\Delta P}{P} = [-MD' (\Delta y)] + [Convexity' (\Delta y)^2]$$

7.50 Price Volatility Characteristics

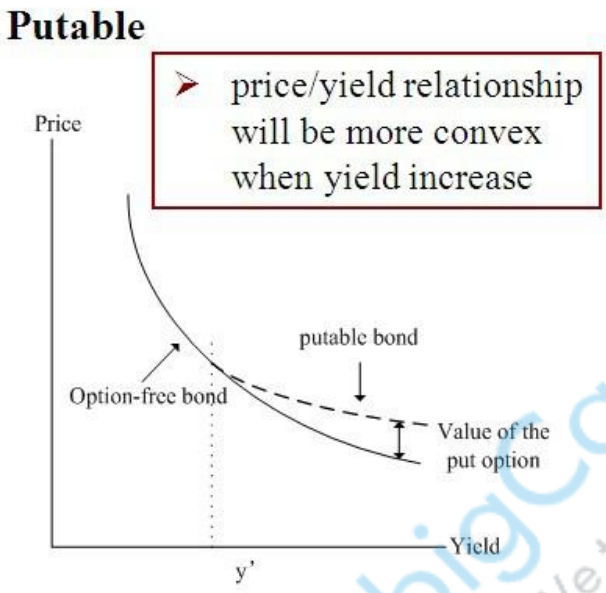
- for option-free bonds



- For callable bonds



- For putable bonds



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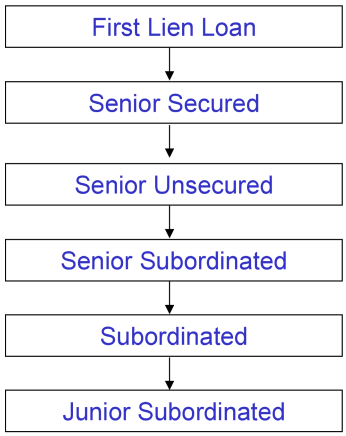
7.51 Credit risk and credit-related risks affecting corporate bonds

- **Credit risk** is the risk of loss resulting form the borrower (issuer of debt) failing to make full and timely payments of interest and/or principal. It has two components.
  - **Default risk**, or default probability, is the probability that a borrower defaults – that is, fails to meet its obligation to make full and timely payments of principal and interest, according to the terms of the debt security.
  - **Loss severity**, or loss given default, in the event of default, is the portion of a bond's value (including unpaid interest) an investor loses.
- Expected loss = Default probability * Loss severity given default
  - **Loss severity given default = 1 – Recovery rate**
  - **Recovery rate** is the percentage of the principal amount recovered in the event of default.
    - ✓ Highest for debt with the highest priority of claims and decrease with each lower rank of seniority.
- **Spread risk:** Corporate bonds and other "credit-risky" debt instruments typically trade at a yield premium, or spread, to bonds that have been considered "default-risk free".
  - **Credit migration (or downgrade) risk**: this is the risk that a bond issuer's creditworthiness deteriorates, or migrates lower, leading investors to believe the risk of default is higher and thus causing the yield spreads on the issuer's bonds to widen and the price of its bonds to fall.
  - **Market liquidity risk:** this is the risk that the price at which investors can actually transact may differ from the price indicated in the market.

7.52 Seniority rankings of corporate debt

- **Capital Structure:** the composition and distribution across operating units of a company's debt and equity, including bank debt, bonds of all seniority rankings, preferred stock, and common equity.
- **Seniority ranking**



  - The lower the seniority ranking of a bond, the higher its credit risk. Investors require a higher yield to accept a lower seniority ranking
- **Priority of claims:** in the event of default, unsecured debtholders claim rank below (i.e., get paid after) those of secured creditors.
  - **The priority of claims in bankruptcy:**
    - ✓ secured creditors > unsecured creditors

- ✓ senior creditors > junior creditors

7.53 Issuer credit rating and Issue ratings

- Issuer credit rating: address an obligor's overall creditworthiness – its ability and willingness to make timely payments of interest and principal on its debt
- Issue ratings: specific financial obligations of an issuer and take into consideration such factors as ranking in the capital structure (e.g., secured or subordinated).
  - Notching is the practice by rating agencies of assigning different ratings to bonds of the same issuer.

7.54 The four Cs of credit analysis

- **Capacity** refers to the ability of the borrower to make its debt payments on time.
- **Collateral** refers to the quality and value of the assets supporting the issuer's indebtedness.
- **Covenants** are the terms and conditions of lending agreements that issuer must comply with.
- **Character** refers to the quality of management.

7.55 Ratios and ratio analysis

- Profitability and cash flow measures
  - EBITDA =operating income + dep. & amor.
  - FFO = NI from continuing operations + dep. & amor. + deferred income taxes + other non-cash items
  - FCF before div. = NI + dep. & amor. – capital expenditure – increase (plus decrease) in non-cash working capital – non-recurring items
  - FCF after div. = FCF before div. – div
- Leverage ratios
  - Debt/Capital
    - ✓ Capital = total debt + shareholders equity
    - ✓ A lower ratio indicates less credit risk.
  - Debt/EBITDA
    - ✓ A higher ratio indicates higher leverage and higher credit risk
  - FFO/Debt
    - ✓ A higher ratio indicates lower credit risk
- Coverage ratios
  - EBITDA/Interest expense
    - ✓ A higher ratio indicates lower credit risk
    - ✓ Used more often
  - EBIT/Interest expense
    - ✓ A higher ratio indicates lower credit risk

7.56 Yield on corporate bond

- Yield on corporate bond = real risk-free interest rate + expected inflation rate + maturity premium + liquidity premium + credit spread
  - Yield spread = liquidity premium + credit spread

7.57 Return impact of spread changes

- The modified duration of the bond
- The magnitude of the spread change

- For small spread change:
  Return impact ≈ - modified duration × Δ spread
- For larger spread changes

Return impact ≈ - modified duration × Δ spread + 0.5×convexity ×(Δ spread) ^{2}

7.58 Credit analysis of high yield bond

- High-yield corporate bonds: rated below Baa3/BBB-
- Special considerations of high-yield credit analysis:
  - Greater focus on issuer liquidity and cash flow
  - Detailed financial projections
  - Detailed understanding and analysis of the debt structure
  - Understanding of an issuer's corporate structure
  - Covenant analysis
    - ✓ Change of control put
    - ✓ Restricted payments
    - ✓ Limitations on liens
    - ✓ Restricted versus unrestricted subsidiaries

7.59 Credit analysis of sovereign and municipal debt

- **Sovereign debt**
  - Definition: Sovereign debt is issued by national governments
  - Evaluation
    - ✓ Political and economic profile
    - ✓ Flexibility and performance profile
- **Municipal debt**
  - GO bonds——taxing authority
  - Revenue-backed bonds ——the revenues generated by usage fees and tolls levied

8 衍生

8.1 Classification of Derivatives

- **根据合约特点分类：Forward commitment & Contingent claim**
  - Forward commitment: is an agreement between two parties in which one party, the buyer, agrees to buy from the other party, the seller, an underlying asset at a future date at a price established at the start ◊ forward, futures and swap contracts
  - Contingent claim: is derivative in which the payoffs occur if a specific event happens ◊ option contracts
- **根据交易场所分类：Exchange-traded & Over-the-counter traded**
  - Exchange-traded：在一个固定的交易所交易。多空双方不直接见面，与清算所交易
  - OTC traded：没有固定交易场所，多空双方直接交易

Exchange-traded	Over-the-counter
standardized◊ liquid	customized
backed by a clearinghouse	trade with counterparty (default risk)
trade in the a physical exchange	not trade in a central location
regulated	unregulated

8.2 Advantage & Disadvantage of Derivative

- Advantage:
  - Price discovery
  - Risk management: hedge and speculation
  - Lowering transaction costs
- Disadvantage:
  - Too risky◊High leverage
  - Complex instruments
  - Sometimes likened to gambling

8.3 Risk-free arbitrage and no-arbitrage rule

- Arbitrage opportunities: arbitrage occurs when equivalent assets or combinations of assets sell for two different prices
- Arbitrage involves earning over the risk-free rate with no risk or earning an immediate gain with no future liabilities
- Law of one price: two securities or portfolios that have identical cash flows in the future, regardless of future events, should have the same price
- The way of arbitrage: sell high, buy low
- If a portfolio consisting of A and B has a certain payoff, the portfolio should yield the risk-free risk
- The role of arbitrage is to eliminate mispricing and lead to the market efficiency. That is why arbitrage also plays a role in pricing.

8.4 Purposes of trading forward contracts

- Hedge risk：套期保值，锁定未来交易成本，但不保证一定比不实施套期保值赚钱。存在 default risk。

- Speculation：投机，赌未来价格的变化方向，可以举杠杆。

8.5 Characteristics of Forward contracts

- Each party are exposed to default risk (or counterparty risk).
- Zero-sum game.

8.6 Settlement of Forward Contract

- Settling a forward contract at expiration
  - Physical settlement: deliver an actual asset，存在储存成本，多用于商品远期
  - Cash settlement: the party that has a position with negative value is obligated to pay that amount to the other party，多用在金融远期
- Settling a forward contract prior to expiration
  - Entering into an opposite forward contract: with an expiration date equal to the time remaining on the original contract
    - ✓ Offsetting with a different party: some credit risk remains
    - ✓ Offsetting with the original party: can avoid credit risk

8.7 Equity forward

- 交割方式：Equity forwards: physical or cash settlement (based on the value of a stock, a specific portfolio of stocks).

8.8 Equity index forward

- 交割方式：Stock index forward: cash settlement
- 考点：Dividends are never included in the Equity forward? （No）.

8.9 Bond forward contracts

- 与 Equity Forward 区别：Equities do not have a maturity date, bonds do, and the forward contract must settle before the bond matures.
- 报价方法：
  - T-bill prices are often quoted as 100-annualized discount in percent on the T-bill.
  - Coupon bonds are often quoted as a YTM

8.10 Forward Rate Agreement (FRA)

- LIBOR, Euribor, and FRAs
  - Eurodollar time deposit.
  - London Interbank Offer Rate (LIBOR).
    - ✓ USD interest rates.
    - ✓ Quoted as an annualized rates based on a 360-day a year
    - ✓ Add-on rate
    - ✓ Single interest
  - Euribor is a similar rate for borrowing and lending in Euros
  - A forward rate agreement (FRA) is a forward contract on an interest rate (LIBOR)
  - **FRA 定义：**An FRA can be viewed as a forward contract to borrow/lend money at a certain rate at some future date.
    - ✓ **The long position:** is the party that would borrow the money
    - ✓ **The short position: i**s the party that would lend the money
    - ✓ 报价： Example: 3×6 FRA
  - The general formula for the payment to the long at settlement is:

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

8.11 Currency Forward

- 交割方式：Cash or deliverable

8.12 Compare futures and forward

- 与 forward contract 相似点
  - Can be either deliverable or cash settlement contracts;
  - Are priced to have zero value at the time an investor enters into the contract
- 与 forward 区别

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

8.13 Futures contracts

- Standardization：
  - Futures contracts specify the quality and quantity of goods that can be delivered, the delivery time and the manner of delivery.
- clearinghouse
  - Each exchange has a clearing house that guarantees that traders in the futures market will honor their obligations.
  - A clearinghouse acts as the counterparty to each participant. The clearinghouse is the buyer to every seller and the seller to every buyer.
  - There is no need to worry about the counterparty default risk.
  - Clearing house allows either side of the trade to reverse positions at a future date.

8.14 Futures contract 风险控制方法

- Margin:
  - Initial margin: The first deposit is called the initial margin. Initial margin must be posted before any trading takes place;
  - Maintenance margin: If the margin balance in the trader's account falls below the maintenance margin, the trader will get a margin call
  - Variation margin: used to bring the margin balance back up to the initial margin level.
- Daily Price Limit 涨跌停机制:
  - Price limits are exchanged-imposed limits on how much the contract price can change from the previous day's settlement price;
  - Limit move: If traders wish to trade at prices outside these limit---no trades will

take place.---the settlement price will be reported upper or lower price limits

- Locked limit: if trades cannot take place because of a limit move, either up or down, the price is said to be locked limit, since no trades can take place and traders are "locked" into their existing positions.

➢ Marking to market：

- The margin requirement of a future contract is low because at the end of every day there is a daily settlement process called marking to market

8.15 Four ways to terminate a futures contract

➢ 到期日交割：

- Delivery of the asset specified in the contract: a short can initiate the delivery process, a long by accepting delivery and paying the contract price to the short.
- Cash payment at expiration

➢ 提前交割：

- Close out or offsetting trade
- An exchange for physicals: off the floor of the exchange (called an ex-pit transaction)

➢ Delivery option：

- The short has the right to decide what, where and when to deliver.

8.16 Five types of futures contracts

➢ Treasury bill futures contracts

- based on a $1 million face value 90-day T-bill and settle in cash.---the price quotes are 100 minus the annualized discount in the percent on the T-bills.

➢ Eurodollar futures

- based on 90-day LIBOR, which is an add-on yield---quoted as 100 minus annualized 90-day LIBOR, and settle in cash

➢ Treasury bond futures contracts ：

- Are traded for treasury bonds with maturities greater than 15 years.
- Are a deliverable contract: a delivery option to the short
- Have a face value of $100,000
- Are quoted as a percent and fractions of one percent of face value

➢ Stock index futures

➢ Currency futures

8.17 Classification of Option Contract

➢ 分类方法一：按交割时间分：

- American option 美式期权: allow the owner to exercise the option at any time before or at expiration
- European options 欧式期权: can only be exercised at expiration.
- 美式期权价格>=欧式期权价格 due to more flexibility.

➢ 分类方法二：按交易场所分：

- Exchanged-traded: regulated, standardized, liquid;
- OTC options：customized, primarily for institutional buyers.

➢ 分类方法三： 按标的物类型分：

- Financial options: include equity options and other options based on stock indexes, Treasury bonds, interest rates, and currencies.

- ✓ Bond Options: most are OTC options that can be deliverable or settle in cash.
- ✓ Index Options: settle in cash, nothing is delivered.
- ✓ Options on futures: sometimes called futures options, give the holder the right to buy or sell a specified futures contract on or before a given date at a given futures price, the strike price.

- Commodity options: give the holder the right to either buy or sell a fixed quantity of some physical asset at a fixed (strike) price.

8.18 Moneyness

- In the money: Immediate exercise would generate a positive payoff
- At the money : Immediate exercise would generate no payoff
- Out of the money : Immediate exercise would result in a loss

8.19 **Intrinsic Value of Option Contract** (定量看 long 赚多少钱)

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

8.20 Caps and Floors

- An interest rate cap is a series of interest rate call options (each call option is called a caplet), 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 place a maximum (upper limit) on the interest payments on a floating rate loan.
- An interest rate floor is a series of interest rate put options, (each call option is called a floorlet) having expiration dates that correspond to the reset dates on a floating rate loan. Floors are often used to protect a floating rate lender from a decline in interest rates.
  - Floors place a minimum (lower limit) on the interest payments that are received from a floating rate loan.
- An interest rate collar is the combination of a cap and a floor is called an interest rate collar.
- Long interest rate call + short interest rate put = FRA.
- Long Caps + Short Floors = interest Rate Swap

	Interest Rate Options	**FRAs**
Similarity	There is no deliverable asset	
	They are settled in cash, in an amount based on a notional amount and the spread between the strike rate and the reference rate.	
Differences	Can choose to exercise or not	Must exercise

	Payoffs are made at the end of the loan period	Payoffs are made at the beginning of the loan period
	Payoffs need not to discount	Payoffs need to discount

8.21 Minimum and Maximum Option Values

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

8.22 Price Sensitivity of Option Price

Factor	European call	European put	American call	American put
Underlying asset price	+	-	+	-
Strike price	-	+	-	+
Time	?	?	+	+
Risk-less rate	+	-	+	-
Volatility	+	+	+	+

8.23 Put call parity

- $c + X/\left(1+R_f\right)^{T-t} = S + p$

8.24 Early Exercise of American Options

- American call options
  - when the underlying makes no cash payments, no reason to exercise the call early, C0 = c0,
  - when the underlying makes cash payments during the life of the option, early exercise can happen, C0 > = c0
- American put options
  - P0 > p0 , nearly always true, as long as there is a possibility of bankruptcy , P0 always > p0 (consider an American put on a bankrupt company, stock →0, cannot go any lower, then put option holder may exercise it)

8.25 Methods of Terminating a Swap

- Mutual termination
- Offsetting swap contract
- Resale to a third party (unusual)
- Exercising a swaption
  - Swaption: An option to enter into an offsetting swap

8.26 Interest Rate Swaps

- The plain vanilla interest rate swap involves trading fixed interest rate payments for floating-rate payment (paying fixed and receiving floating).

- Counterparties: The parties involved in any swap agreement are called the counterparties
- Pay-fixed side: The counterparty that wants variable-rate interest agrees to pay fixed-rate interest.
- Pay-floating side: The counterparty that receives the fixed payment and agrees to pay variable-rate interest.

➢ Cash flow of an IRS

- The basic formula for the net fixed-rate payment in an interest rate swap is:

$$\begin{pmatrix}\text{net fixed rate}\\ \text{payment}\end{pmatrix}_t = \begin{pmatrix}\text{swap fixed}\\ \text{rate} - \text{LIBOR}_{t-1}\end{pmatrix}\left(\frac{\text{number of days}}{360}\right)\begin{pmatrix}\text{notional}\\ \text{principal}\end{pmatrix}$$

8.27 Currency swaps

➢ The cash flows that would occur in a currency swap are as follows:

- Unlike an interest-rate swap, the notional principal actually changes hands at the beginning of the swap.
- Interest payments are made without netting. Full interest payments in two different currencies are exchanged at each settlement date.
- At the termination of the swap agreement (maturity), the counterparties return the notional amounts. Notional principal is swapped again at the termination of the agreement

8.28 Equity Swaps

➢ In an equity swap, the return on a stock, a portfolio, or a stock index is paid each period by one party in return for a fixed payment. The return can be the capital appreciation or the total return including dividends on the stock or portfolio. The payment is calculated as the percentage return on the equity over the period times the notional amount of the swap.

➢ In an equity swap, the first payment (and the others) are unknown and the fixed rate payer may actually pay more than the fixed rate if the equity return is negative over the period.

➢ It may help to remember that the party that pays equity returns would receive a fixed return on the equity portfolio combined with the swap, regardless of the equity portfolio performance.

	Interest Rate Swaps	**Currency Swaps**	**Equity Swaps**
At the initiation and the termination of the swap	No need to exchange principal	Notional principal is swapped	No need to exchange principal
During the periods	Net interest is paid by the party who owes it	Interest payments are made without netting	The return is paid each period by one party in return for a fixed payment
	The netting payment is known at the beginning of a period		The netting payment is known at the end of a period

	May not pay more than the fixed-rate interest		The fixed rate payer may pay more than the fixed rate if the equity return is negative over the period

8.29 Covered Call

- covered call=S－C
- Breakeven Point-Covered Call

$S_t<X$ Profit= { Stock: S_t-S_0 ; Option: C } ⇨ Total Profit=S_t-S_0+C

$S_t>=X$ Profit= { Stock: S_t-S_0 ; Option: C-(S_t-X) } ⇨ Total Profit=$X-S_0+C$

最大收益

- Summary
  - Consists of: short call and long stock
  - Equivalent to: short put and long bond
  - Similar to: Short put
  - Breakeven point: S0-c
  - Maximum Gain: X-(S0-c)

8.30 Protective Put

- protective put=S+P
- Breakeven Point- Protective Put

$S_t<X$ Profit= { Stock: S_t-S_0 ; Option: $X-S_t-P$ } ⇨ Total Profit=$X-S_0-P$

最大损失

$S_t>=X$ Profit= { Stock: S_t-S_0 ; Option: -P } ⇨ Total Profit=S_t-S_0-P

- Summary
  - Consists of: long stock and long put
  - Equivalent to: long call and long bond
  - Similar to: long call
  - Breakeven point: S0+p
  - Maximum Loss: X-(S0+p)

9 另类投资

9.1 Traditional vs. alternative investments

- Traditional: long-only investments in stocks, bonds, and cash, etc.
- Alternative: other investment vehicles which fall outside the scope of traditional investments, extensive use of leverage.

9.2 Characteristics of alternative investments

- Illiquidity of underlying investments
- Narrow manage specialization
- Low correlation with traditional investments
- Low level of regulation and less transparency
- Limited and potentially problematic historical risk and return data
- Unique legal and tax considerations

9.3 Alternative Investments- Categories

- Hedge funds：Manage portfolios of securities and derivative positions using a variety of strategies. Long and short positions, highly leveraged, absolute return.
- Private equity funds：Invest in start-up companies that are not publicly traded, or in public companies with the intent to take them private.
- Real estate：Outright ownership or through real estate equity/debt investments. E.g. MBS, REITs, etc.
- Commodities：In physical commodity products, either through owning cash instruments, utilizing derivatives, or investing in businesses engaged in the production of commodities.
- Other：Tangible (Fine wine, art, stamp, coin, etc.) and intangible (patents)

9.4 Alternative Investments- return strategies

- Passive management
  - Assume markets are efficient, focus on beta drivers of return.
- Active management
  - Assume that inefficiencies exist, earn positive return after adjusting for beta risk, which is defined as alpha return.
  - The expected alpha return is zero for passive managers.

9.5 Basic alpha-seeking strategies:

- Absolute return:
  - Seek to generate returns that are independent of market returns.
  - Betas are close to zero, no market index to beat.
  - Relative performance objectives and absolute return target.
- Market segmentation:
  - When capital cannot migrate effortlessly from lower expected return to higher ones, due to investment constraints.
- Concentrated portfolios:
  - Concentrating assets rather than diversifying, in order to exchange diversification for higher returns if these concentrated positions outperform the market.

9.6 Investment structures

- Limited partner (LP): LP is the investors who understand and able to assume the risks in the investment.

- General partner (GP): GP runs the fund

9.7 Characteristics of hedge funds

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

9.8 Funds of funds:

- FOFs enable small investors to have returns in hedge funds.
- FOFs have some expertise in conducting due diligence on hedge funds
- Negotiate better redemption terms for investors.
- FOFs invest in numerous hedge funds, diversifying across fund strategies, investment regions, and management styles.

9.9 Hedge fund strategies

- Event-driven strategies
  - Seek to profit from short-term events that will affect individual companies.
  - Considered "bottom up" strategy.
  - Include long/short positions in common and preferred stocks, as well as debt securities and options.
- Relative value strategies
  - Seek to profit from a pricing discrepancy between related securities.
- Macro strategies
  - "top down" approach to identify economic trends
  - Use long/short positions to potentially profit from a view on overall market direction as influenced by major economic trends or events.
  - Trade opportunistically in the fixed income, equity, currency, and commodity markets.
- Equity hedge strategies
  - focused on public equity markets
  - use a "bottom up" approach

9.10 Hedge Fund Fees

- Management fee
  - Based on capital under management.
    - ✓ Attractive to portfolio managers because the management fee alone will generate significant revenue if assets under management are large.
  - Earned irrespective of returns.
- Incentive fee

- Based on profits net of (or before) management fee
- Only earned if the return exceeds a hurdle rate
- High water mark ◊ highest value reported

➢ Negotiable terms
- Fees, notice and lockup periods are negotiable with potential investors.
  - ✓ longer investment periods, lower fees.

9.11 Fee structure comparisons – hedge funds and FOFs

➢ Return to an investor in a fund is different from the return to the fund.

➢ Fee structure of funds of funds will further dilute returns to the investor, but this disadvantage is balanced with several attractive features.
- FOFs may provide a diversified portfolio of hedge funds,
- may provide access to hedge funds that may otherwise be closed to direct investments
- may offer expertise in and conduct due diligence in selecting the individual hedge funds.
- may also have negotiated redemption terms that are more favorable, e.g. a shorter lockup period or notice period

9.12 Due diligence——FOF

➢ investment strategy
➢ investment process
➢ competitive advantage,
➢ track record,
➢ size and longevity,
➢ management style,
➢ key-person risk,
➢ reputation,
➢ investor relations,
➢ plans for growth,
➢ systems risk management.

9.13 Private Equity

➢ Leveraged buyouts (LBOs): acquire companies with a significant percentage of the purchase price financed through debt.
- Assets of the target company as the collateral for the debt
- The debt becomes part of the capital structure of the target company

➢ Venture capital: invest in private companies with high growth potential.

➢ Development capital: minority equity investment in mature firms that are looking for expanding or restructuring opportunities.

➢ Distressed investing: buying the debt of mature companies in financial difficulties.

9.14 Private Equity Strategies – LBOs

➢ LBO with debt financing
- If debt financing is unavailable or costly, less likely to occur.

➢ Typical LBO capital structure
- Equity, leveraged loans, high yield bonds

➢ Mezzanine financing is an alternative to bonds.

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

9.15 Characteristics of Attractive Target Companies for LBOs

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

9.16 The stage of venture capital investing

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

9.17 Private Equity – Exit strategies

- Trade Sale: sale of a company to a strategic buyer
  - Advantages: (a) immediate cash exit; (b) potential for high valuation; (c) fast and simple execution; (d) lower transaction costs than an IPO; (e) lower levels of disclosure and higher confidentiality
  - Disadvantages: (a) possible opposition by management; (b) lower attractiveness.to employees of the portfolio company; (c) limited number of potential buyers; (d) a

possible lower price than in an IPO

- IPO
  - Advantages: (a) potential for the highest price; (b) management approval; (c) publicity for the private equity firm; (d) ability to retain future upside potential
  - Disadvantages: (a) high transaction costs; (b) long lead times; (c) risk of stock market volatility; (d) high disclosure requirements; (e) potential lock-up period; (f) **IPO is** usually only appropriate for larger companies with attractive growth profiles.
- Recapitalization
  - Not a true exit strategy, but allows investors to extract money from the company.
  - Very popular when interest rates are low
  - Often a prelude to a later exit
- Secondary Sale: sale to another private equity firm or other group of investors
- Write-off/Liquidation: When a transaction has not gone well, liquidate the investment to move on to other projects.

9.18 Portfolio Company Valuation

- Market or comparable: value a company or its equity using multiples
  - EBITDA multiple
- DCF approach
  - FCFF and WACC —— company value
  - FCFE and Ke ——company's equity value
  - Simple approach: income or cash flow divided by a capitalization rate
- Asset-based
  - arrives at the value of the company to the equity holders
  - assumes that the company value = Asset － liabilities
  - Can be valued by using fair values or liquidation values
    - ✓ Fair values assume an orderly transaction
    - ✓ Liquidation values assume a distressed transaction

9.19 Key reasons for investing in real estate

- Competitive long-term total returns driven by income generation and capital appreciation.
- Fixed rents may lessen cash flow impact from economic shocks.
- Diversification benefits may be provided by less than perfect correlation with other asset classes
- Potential to provide an inflation hedge if rents can be adjusted quickly for inflation.

9.20 Real Estate——Investment categories

- Residential property
- Commercial real estate
  - Appropriate direct investment (equity and debt) for institutional funds or high-net-worth individuals with long time horizons and limited liquidity needs.
- REIT Investing
  - Risk and return characteristics depend on the type of investment
    - ✓ Mortgage REITs
    - ✓ Equity REITs
- MBS

- MBS structure is based on the securitization model of buying a pool of assets and assigning the income and principal returns into individual security tranches.
- MBS may be issued privately or publicly.

➢ Timberland and Farmland

9.21 Common techniques for appraising real estate property

➢ Comparable sales approach
- determine an approximate value based on recent sales of similar properties.
- condition, age, location, and size

➢ Income approach
- Direct capitalization
  - ✓ NOI ◊ property level CFO; cap rate
  - ✓ strength of tenants, the level of landlord involvement, the extent of repairs and improvements, the vacancy rate, management and operating costs, expected inflation of costs and rent.
- DCF approach

➢ Cost approach

9.22 REIT valuation

➢ Income based approach
- Similar to the direct capitalization approach
- Funds from operation (FFO) and adjusted funds from operation (AFFO)
- Cap rate

➢ Asset based approach
- REIT’s NAV = MKT value of assets – MKT value of liabilities
- REIT shares trade at prices that differ from its NAV per share. (premiums or discounts)

9.23 Real Estate Investment Risks

➢ Property values are subject to variability based on national and global economic conditions, local real estate conditions, and interest rate levels.

➢ Other risks include fund management ability, and changes in government regulations.

➢ Property development is subject to regulatory issues, construction delays, and cost overruns.

➢ Acquisitions and developments may be financed with lines of credit rather than long-term debt financing.

➢ Leverage increases the risk to equity investors and also debt investors.

9.24 Commodities

➢ Futures and forward contracts
- Futures contracts are exchange-traded products (ETPs)
  - ✓ No physical delivery
- Forward contracts trade OTC
  - ✓ Physical delivery can be expected

➢ Options contracts
- Options can be ETPs or OTC traded

➢ Swaps contracts

9.25 Commodity indices

- use the price of futures contracts on the commodities, rather than the prices of the commodities themselves.
- performance of an index can be quite different from the performance of the underlying commodities.
- vary in the constituents and the weighting methods used

9.26 Alternative means of achieving commodity exposure:

- ETF
  - suitable for those who can only buy equity or seek the simplicity of trading.
  - may use leverage
- Common stock of companies exposed to a particular commodity
  - E.g. Sinopec
- Managed futures funds
  - Similar to hedge funds in structure
- Individual managed accounts
  - managed by professional managers on behalf of high net worth individuals or institutional investors
- Funds in specific commodity sectors

9.27 Other Alternative Investments

- Definition: Tangible assets such as antiques and fine art, fine wine, rare stamps and coins, jewelry and watches, and sports memorabilia.
- do not provide current income, but can potentially provide long-term capital appreciation, diversify a portfolio, and be a source of enjoyment
- can fluctuate dramatically in value, highly illiquid

9.28 Investment and risk management

- Risks vary across alternative investments
- Historical returns and standard deviation
- Difference in risk-return profile
- Illiquid investments
- Fee structures
- Limited transparency
- Investment committee of partners
- Independent valuation of illiquid underlying assets
- Hedge fund risk monitored by a chief risk officer

9.29 Commodities and its derivatives

- Motivations for
  - Investing in commodities
    - ✓ While a passive investor seeks to diversification benefits through a collateralized futures fund
  - Investing in commodities derivatives
    - ✓ While an active investor seeks to profit from anticipating moves in commodity prices and is more likely to use futures
  - Investing in commodity-linked securities: commodity-linked equity, commodity-linked bonds
  - While investors want to exposure to commodity price moves for either hedging or

speculation

- The sources of return on a collateralized commodity futures position
  - A collateralized commodity futures position involves investing in the futures along with an investment in Treasury securities (such as T-bills) equal to the value of the futures contract
  - Will have returns:
  - from commodity futures price changes
  - from the interest income of the Treasury position

9.30 The role of commodities for investing in production and consumption

- Investing in commodities gives an investor exposure to an economy's production and consumption growth.
  - E.g. when the economy experiences growth, the demand for commodities increases, and price increases are likely.
  - During recessions, commodity prices are likely to fall with decreased demand.
- Overall, swings in commodity prices are likely to be larger than changes in finished goods prices.

9.31 Relationship between spot prices and expected future prices

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

10 组合管理

10.1 Portfolio perspective

- Definition: evaluate individual investments by their contribution to the risk and return of an investor's portfolio.
- Diversification allows an investor to reduce portfolio risk without necessarily reducing the portfolio's expected return.
- During periods of financial crisis, correlations tend to increase, which reduces the benefits of diversification.

10.2 The types of investment management clients

- Individual investors
- DC pension plan: the individual makes the investment decisions and takes on the investment risk.
- DB pension plan: be funded by company contributions and have an obligation to provide specific benefits to retirees.
- Endowment: a fund that is dedicated to providing financial support on an ongoing basis for a specific purpose.
- Foundation: a fund established for charitable purposes to support specific types of activities or to fund research related to a particular disease.
- Bank
- Insurance company
- Investment companies
- Mutual funds
- Sovereign wealth funds: pools of assets owned by a government.

投资者	风险容忍度	投资期限	流动性需求	收入需求
个人投资者	取决于个人	取决于个人	取决于个人	取决于个人
规定收益型养老基金	高	长	低	取决于年龄
银行	低	短	高	付利息
基金会	高	长	低	支出水平
保险公司	低	寿险——长 非寿险——短	高	低
共同基金	取决于基金	取决于基金	高	取决于基金

10.3 Steps in portfolio management process

- Planning step:
  - Analysis of the investor's risk tolerance, return objectives, time horizon, tax exposure, liquidity needs, income needs, unique circumstances;
  - IPS: details the investor's investment objectives and constraints; specify an objective benchmark; updated at least every few years and anytime the investor's objectives or constraints change significantly.

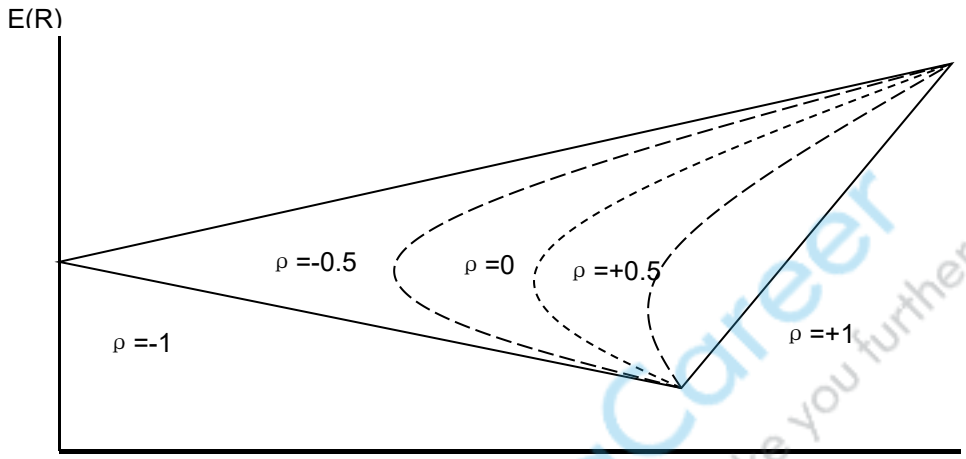
- Execution step: asset allocation; top-down analysis & bottom-up
- Feedback step:
  - monitor and rebalance the portfolio;
  - Measure portfolio performance.

10.4 Major Return and Risk Measure

- HPR
- Average return
  - Arithmetic mean return: unbiased estimator of the true mean
  - Geometric mean return: compound annual rate
  - Money-weighted rate of return: IRR

10.5 Mean, variance, standard deviation of return, covariance and correlation

- Expected Return: $E(R) = \sum_{i=1}^{n} P_i R_i = P_1 R_1 + P_2 R_2 + \cdots + P_n R_n$
- Variance of Return: $\text{Var} = \sigma^2 = \sum_{i=1}^{n} [R_i - E(R)]^2 P_i$
- Standard Deviation of Return: $\text{SD} = \sigma = \sqrt{\sum_{i=1}^{n} [R_i - E(R)]^2 P_i}$
- Covariance
  - Using expectation data: $Cov_{1,2} = \sum_{i=1}^{n} P_i [R_{i,1} - E(R_1)][R_{i,2} - E(R_2)]$
  - Using historical data: $Cov_{1,2} = \frac{1}{n-1} \sum_{t=1}^{n} [R_{t,1} - \overline{R_1}][R_{t,2} - \overline{R_2}]$
- Correlation: $\rho_{1,2} = \frac{Cov_{1,2}}{\sigma_1 \sigma_2}$, $Cov_{1,2} = \rho_{1,2} \sigma_1 \sigma_2$



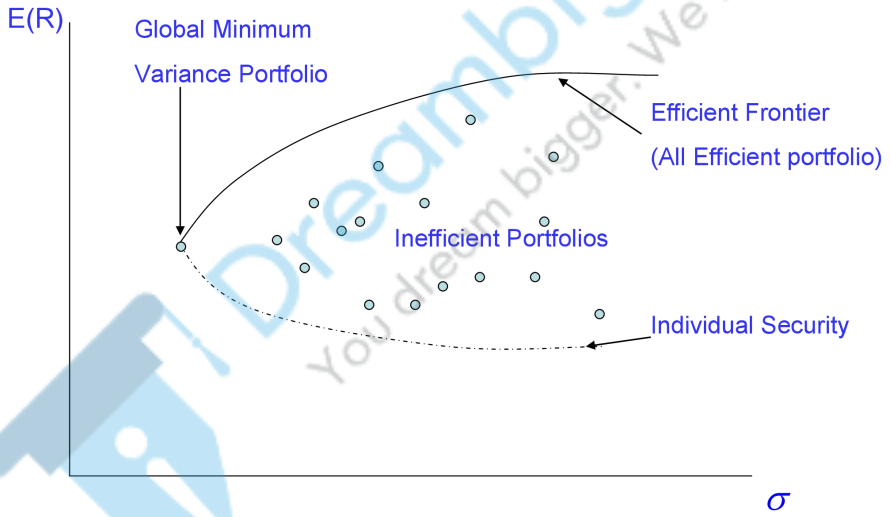
- Portfolio standard deviation: $\sigma_P = \sqrt{\sigma_P^2} = \sqrt{\sum_{i=1}^{n} w_i^2 \sigma_i^2 + \sum_{i=1}^{n} \sum_{j=1}^{n} w_i w_j Cov_{i,j}}$
  - The risk of a portfolio of risky assets depends on the asset weights and the standard deviations of the assets returns, and crucially on the correlation (covariance) of the asset returns.
  - The lower the correlation between the returns of the stocks in the portfolio, all else equal, the greater the diversification benefits.
  - Two-asset portfolio:
  - $\sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2 w_1 w_2 COV_{1,2} = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2 w_1 w_2 \sigma_1 \sigma_2 \rho_{1,2}$

10.6 Minimum variance frontier

- Portfolios that have minimum variance for each given level of expected return
- Global minimum variance portfolio

10.7 Efficient frontier

- All risky assets are contained
- Efficient portfolio: well-diversified or fully-diversified

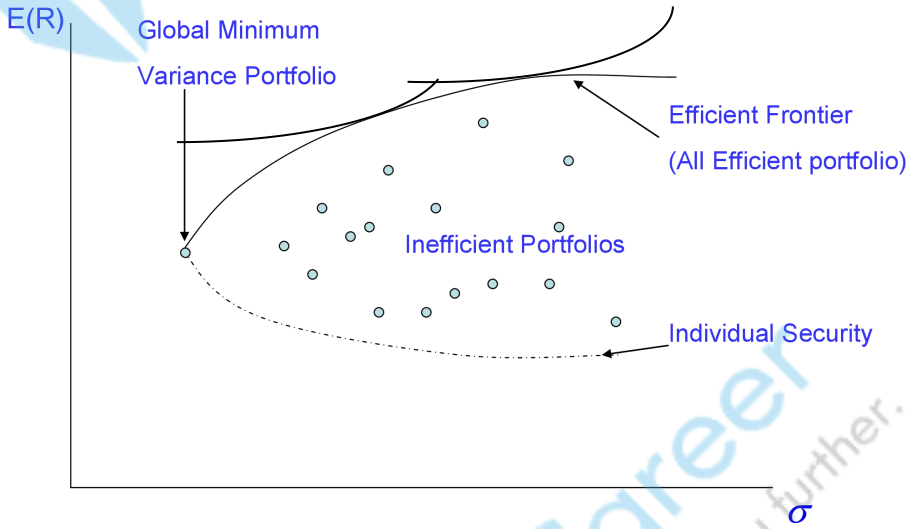


10.8 Risk-aversion

- Refers to the fact that individuals prefer less risk to more risk.
- Risk-averse investors:
  - Prefer lower to higher risk for a given level of expected returns
  - Will only accept a riskier investment if they are compensated in the form of greater expected return

10.9 Optimal portfolio

- The highest indifference curve that is tangent to the efficient frontier
- Different investors may have different optimal portfolios
- At the point of where an investor's (highest) risk-return indifference curve is tangent to the efficient frontier.



10.10 Two-fund separation theorem:

- Combining a risky portfolio with a risk-free asset
- All investors' optimum portfolios will be made up of some combination of an optimal portfolio of risky assets and the risk-free asset.

10.11 CAL

- The line representing these possible combinations of risk-free assets and the optimal risky asset portfolio.
- If each investor has different expectations about the expected returns of, standard deviations of, or correlations between risky asset returns, each investor will have a different optimal risky asset portfolio and a different CAL.

10.12 Capital Market Line

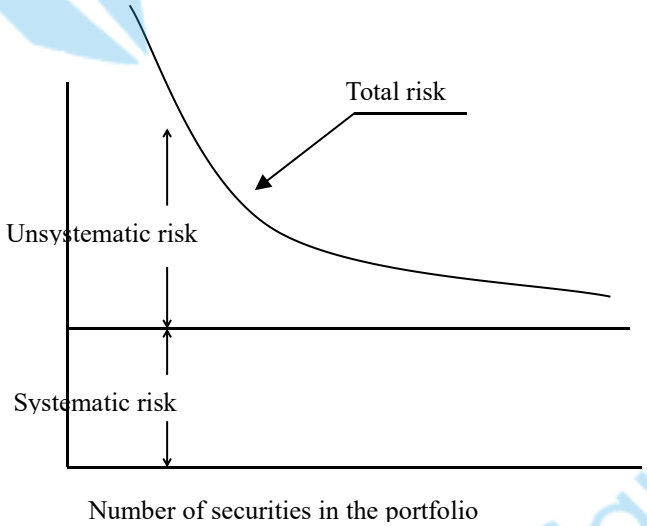
- When investors share identical expectations about the mean returns, variance of returns, and correlations of risky assets, the CAL for all investors is the same and is known as the capital market line (CML):

$$E(R_P) = R_F + \frac{E(R_M) - R_F}{\sigma_M}\sigma_P$$

  - The market portfolio
    - ✓ Is the tangent point where the CML touches the Markowitz efficient frontier.
    - ✓ Consists of every risky assets
    - ✓ The weights on each asset are equal to the percentage of the market value of the asset to the market value of the entire market portfolio.
- Investment using CML follow a passive investment strategy (i.e., invest in an index of risky assets that serves as a proxy for the market portfolio and allocate a portion of their investable assets to a risk-free asset.

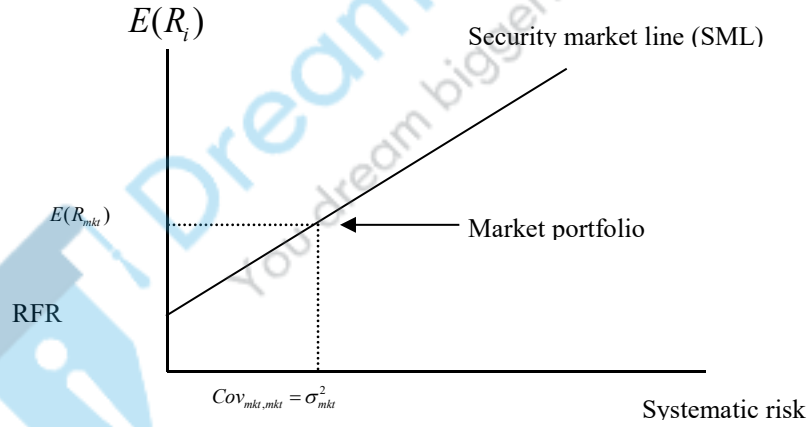
10.13 Systematic risk and unsystematic risk

- Unsystematic risk (or unique, diversifiable, firm-specific risk):
  - The risk that disappears in the portfolio construction process
- Systematic risk (or market risk):
  - The risk that is left cannot be diversified away.
  - Total risk = systematic risk + unsystematic risk



10.14 Security Market Line

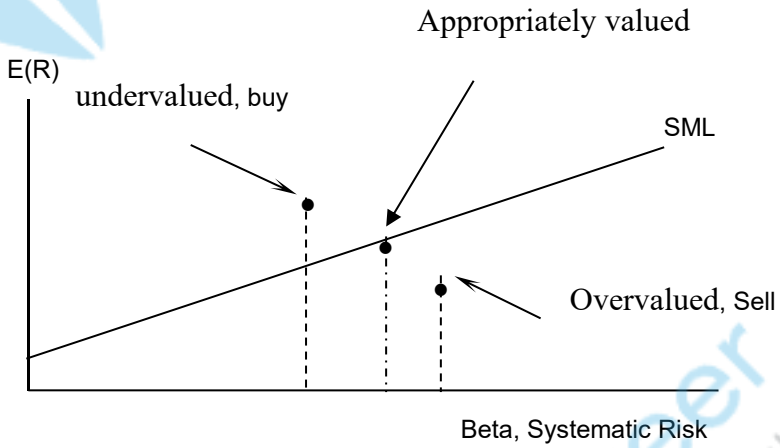
- **The Equation of SML:** $E(R_i)=RFR+\beta_i[E(R_{mkt})-RFR]$
- **Beta:** A standardized measure of systematic risk.
- **Capital Asset Pricing Model**



- Differences between the SML and the CML

	SML	CML
Measure of risk	Uses systematic risk (non-diversifiable risk)	Uses standard deviation (total risk)
Application	Tool used to determine the appropriate expected (benchmark) returns for securities	Tool used to determine the appropriate asset allocation (percentages allocated to the risk-free asset and to the market portfolio) for the investor
Definition	Graph of the capital asset pricing model	Graph of the efficient frontier
Slope	Market risk premium	Market portfolio Sharpe ratio

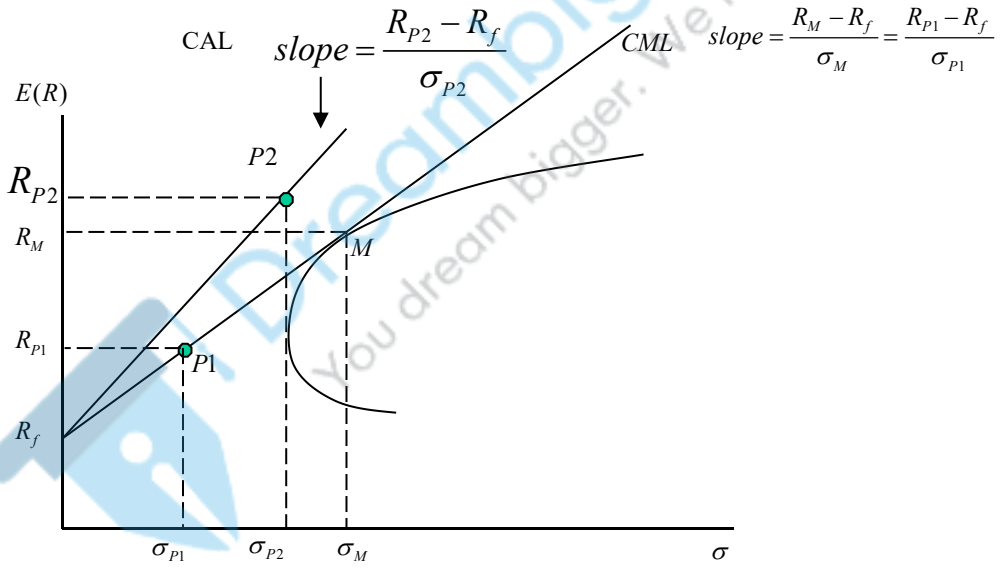
- **Stock mispriced**



10.15 Evaluate relative portfolio performance

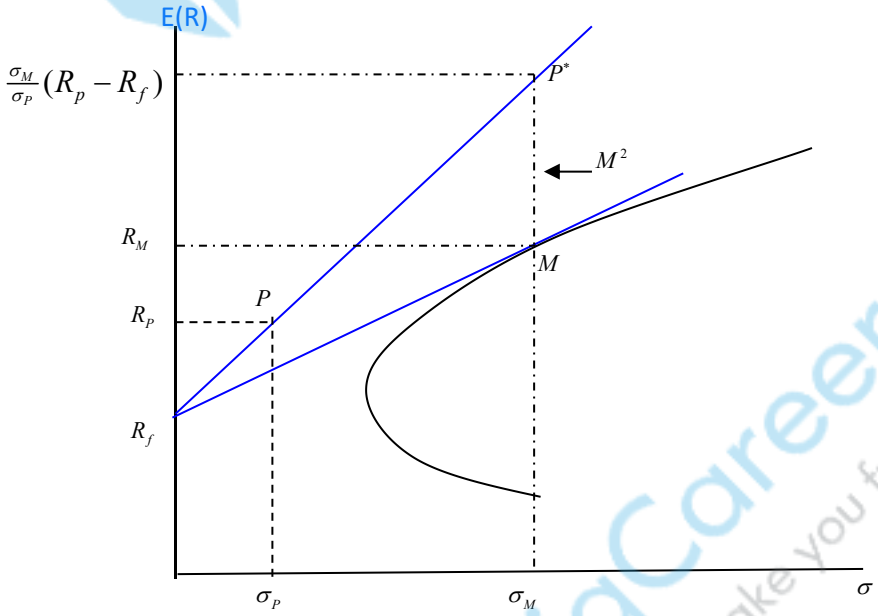
- Sharpe ratio

$$\text{Sharpe ratio}=\frac{R_P-R_f}{\sigma_P}$$



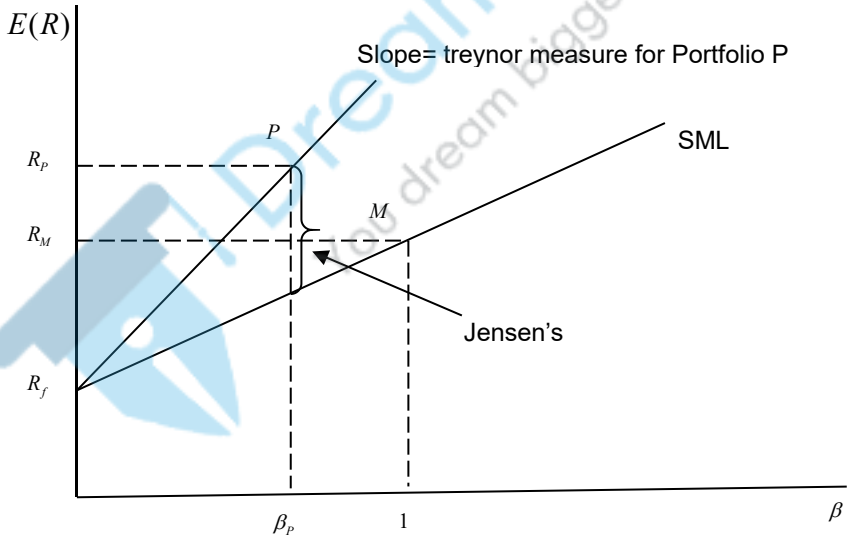
- M-squared

$$M^2=(R_P-R_f)\frac{\sigma_M}{\sigma_P}-(R_M-R_f)$$



- Treynor measure & Jensen's alpha (systematic risk)

Treynor measure= $\frac{R_P - R_f}{\beta_P}$, $\alpha_P = (R_P - R_f) - \beta_P(R_M - R_f)$



10.16 Major components of IPS

- Description of client
- Statement of the purpose
- Statement of duties and responsibilities
- Procedures to update IPS and to respond to various possible situations
- Investment objectives
- Investment constraints
- Investment guidelines
- Evaluation of performance
- Appendices: information on asset allocation

10.17 Investment objectives: risk and return

- Risk objective

- The risk objective limits how high the investor can set the return objective
- Risk measurement: absolute (std dev.), relative (tracking risk), downside risk (VAR)
- Risk tolerance: willingness and ability

Situation		Risk tolerance
willingness > ability		ability (education)
willingness < ability	return objective = willingness	willingness (reevaluation)
	return objective = ability	ability (education)

➢ Return objectives
- Return measurement: total return, inflation-adjusted return, after-tax return
- Total return perspective: balance between capital gains and income
- Stated return desire vs. Required return
- Consistent with risk objective

10.18 Investment constraints
- Liquidity—for cash spending needs (anticipated or unexpected)
- Time horizon—the time between making an investment and needing the funds
- Tax concerns—the tax treatments of various accounts, and the investor's marginal tax bracket
- Legal and regulatory factors—restrictions on investments in retirement, personal, and trust accounts
- Unique needs and preferences—constraints because of investor preferences or other factors not already considered

10.19 Strategic asset allocation
➢ combine the IPS and capital market expectations to formulate weightings on acceptable asset classes
➢ Specify the percentage allocations to the included asset classes
➢ Correlations within the class & correlations between asset classes

10.20 Tactical asset allocation
➢ A manager who varies from strategic asset allocation weights in order to take advantage of perceived short-term opportunities. Depend on:
- The manager's ability to identify shot-term opportunities in specific asset classes;
- The existence of such short-term opportunities.