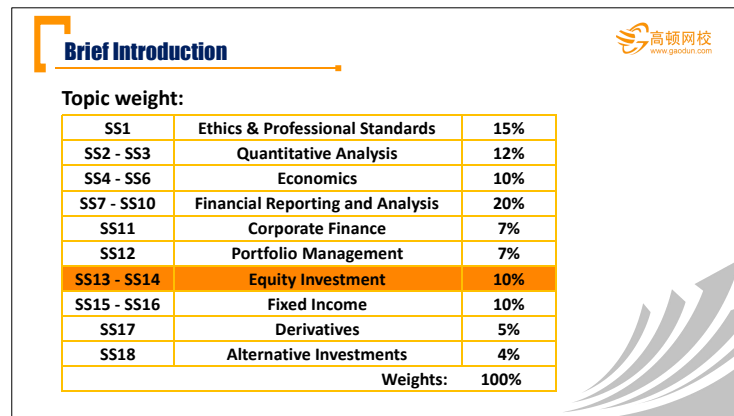




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Equity Investments

-- 2017
Instructor: Jie




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Brief Introduction

Topic weight:

| | | |
|-------------|----------------------------------|------|
| SS1 | Ethics & Professional Standards | 15% |
| SS2 - SS3 | Quantitative Analysis | 12% |
| SS4 - SS6 | Economics | 10% |
| SS7 - SS10 | Financial Reporting and Analysis | 20% |
| SS11 | Corporate Finance | 7% |
| SS12 | Portfolio Management | 7% |
| SS13 - SS14 | Equity Investment | 10% |
| SS15 - SS16 | Fixed Income | 10% |
| SS17 | Derivatives | 5% |
| SS18 | Alternative Investments | 4% |
| Weights: | | 100% |




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Brief Introduction

Content:

- **Study Session 13: Market Organization, Market Indices, and Market Efficiency**
 - Reading 45: Market Organization and Structure
 - Reading 46: Security Market Indices
 - Reading 47: Market Efficiency
- **Study Session 14: Equity Analysis and Valuation**
 - Reading 48: Overview of Equity Securities
 - Reading 49: Introduction to Industry and Company Analysis
 - Reading 50: Equity Valuation: Concepts and Basic Tools



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Brief Introduction

Exam-importance ranking:

- Reading 45: Market Organization and Structure
- Reading 50: Equity Valuation: Concepts and Basic Tools
- Reading 49: Introduction to Industry and Company Analysis
- Reading 46: Security Market Indices
- Reading 47: Market Efficiency
- Reading 48: Overview of Equity Securities

Brief Introduction



考纲对比:

- 与2016年相比, 2017年的考纲几乎没有变化。
 - Reading 47的考纲有一个考点在措词上有少量改变, 但内容没变, 对考试没有影响。

Brief Introduction



学习建议:

- 本课程的部分知识点与其他课程有所交叠, 比如《固定收益》, 《另类投资》, 《公司金融》, 《财报分析》等。学习时注意融会贯通。
- 听课前务必提前预习, 课后务必及时复习。
- 每完成一个任务的学习, 应通过做题来检验学习成果。
- 考试题型包括概念和计算。出计算题的章节通常只有: Reading 45, 46, 50三个章节。

Brief Introduction



会当凌绝顶, 一览众山小!

Financial Markets and Assets

Tasks:

- **Explain** the main functions of the financial system
- **Describe** classifications of assets and markets
- **Describe** the major types of securities, currencies, contracts, commodities, and real assets
- **Describe** types of financial intermediaries and services that they provide

Financial Markets and Assets



The Functions of Financial System

➤ Achieving Entities' Purposes in Using Financial System

- Saving, Borrowing, Raising Equity Capital
- Managing risks
 - ✓ E.g., hedgers use derivatives to manage risks.
- Exchanging assets
 - ✓ E.g., currency exchange
- Information-motivated trading
 - ✓ Information-motivated trader expect to earn an additional return by identifying assets that are currently undervalued or overvalued.

Financial Markets and Assets



The Functions of Financial System (Cont.)

➤ Determining Equilibrium Rates of Return

- **Equilibrium rate of return** is the rate that equates the aggregate supply of funds to the aggregate demand for funds.

➤ Capital Allocation Efficiency

- Economies are **allocationally efficient** when their financial systems allocate scarce capital to the most productive uses.

Financial Markets and Assets



Classification of Assets

➤ Security

- Fixed income (bonds, repo, CDs, convertible debts)
- Equity securities (common shares, preferred shares, warrant)
- Pooled investment vehicles (mutual funds, Hedge funds)

➤ Derivative contracts

- Financial vs. physical derivative contracts

Physical assets

- Commodity (agricultural and energy products, etc.)
- Real asset (real estate, equipment, etc)

Financial Markets and Assets



Type of Securities

- **Public securities:** are traded on exchanges or through securities dealers and are subject to regulatory oversight.
- **Private securities:** are not traded in public markets which are often illiquid and not subject to regulation.

Financial Markets and Assets



Classification of Markets

➤ Money vs. Capital markets

- **Money markets**(货币市场) trade debt instruments maturing in one year or less.
- **Capital markets**(资本市场) trade instruments of longer duration.

Financial Markets and Assets



Classification of Markets (Cont.)

➤ Traditional vs. Alternative markets

- **Traditional markets** trade publicly traded debts and equities and pooled investment vehicles that hold publicly traded debts and/or equities.
- **Alternative markets** include hedge funds, private equity, commodities, real estate securities, collectibles, etc.

Financial Markets and Assets



Classification of Markets (Cont.)

➤ Primary vs. Secondary Markets

- **Primary market**(一级市场) is the market where newly issued securities are sold by issuers to investors.
- **Secondary market** (二级市场) is the market where investors trade to each other.

Financial Markets and Assets



Financial Intermediaries

- **Brokers** (经纪人) help clients buy and sell securities by finding counterparties.
- **Investment banks** provide advice to clients and help them arrange transactions such as IPO and debt offerings.
- **Exchanges** (交易所) provide places where traders can arrange their trades.
- **Alternative trading systems (ATS)** (另类交易系统) serve the same trading function as exchanges but have no regulatory authority, also known as *electronic communication networks(ECNs)* or *multilateral trading facilities(MTFs)*.

Financial Markets and Assets



Financial Intermediaries (Cont.)

- **Dealers (交易商/做市商)** trade by buying for or selling from their own inventory, provide liquidity in the market.
- **Securitizers (证券化商)** buy assets, place them in a pool, then sell securities that represent ownership of the pool.
- **Arbitrageurs (套利商)** buy and sell identical or similar instruments at different prices in different markets.
- **Clearinghouses (清算所)** guarantee contract performance by acting as buyer or seller to their customers.
- **Custodians (托管商)** improve market integrity by holding client assets and preventing their loss due to fraud or other events

Summary



➤ Importance: ☆☆

➤ Content:

- The functions of financial system
- Classification of assets
- Classification of markets
- Financial intermediaries

➤ Exam tips:

- 了解金融系统的功能
- 了解主要金融资产和市场的分类，能对具体资产进行归类
- 了解主要金融媒介及其提供的服务

Primary and Secondary Markets



Tasks:

- **Define** primary and secondary markets and explain how secondary markets support primary markets
- **Describe** how securities and contracts are traded in quote-driven, order-driven, and brokered markets

Primary and Secondary Markets



Public Offerings

- In an **underwritten offering (承销)**, the investment bank guarantees the sale of the entire issue.
- In a **best effort offering (代销)**, the investment bank acts only as broker, and is not obligated to buy the unsold portion if the issue is undersubscribed.

Primary and Secondary Markets



Primary Market

- **IPO(initial public offerings)** (首次公开发行): first-time issues by firms whose shares are not currently publicly traded
- **Seasoned offerings(secondary issues)** (增发新股): new shares issued by firms whose share are already trading in the marketplace
- **Private placement(私募)**: corporations sell securities directly to a small group of qualified investors.

Primary and Secondary Markets



Primary Market

- **Shelf registration** (提前注册/暂搁注册): corporations sell shares directly into the secondary market when they need capital, and when the market is favorable.
- **Dividend reinvestment plan (DRPs)**: allow shareholders to reinvest their dividends in newly issued shares.
- **Right offering** (股权出售): shareholders are given the rights to buy new shares at a discount to the current market price.

Primary and Secondary Markets



Secondary Market

Call market (集合竞价市场)

- Trades can be arranged only when the market is called at a particular time and place.
- All buy and sell orders are gathered, a single price is chosen to maximize the total volume of trade.

Continuous market (连续市场)

- Trades are arranged and executed anytime the market is open.
- The price is determined either by an auction process or through a dealer bid-ask process.

Primary and Secondary Markets



Secondary Market (Cont.)

Quote-Driven Markets (报价驱动市场)

- Also known as *price-driven markets, dealer markets, or over-the-counter(OTC) markets*, customers trade at the prices quoted by dealers.

Brokered Markets (经纪人市场)

- Brokers arrange trades among their clients.
- This service is valuable when a client has a unique or illiquid instrument for which finding a buyer or a seller willing to trade is difficult. (e.g., **block trade** (大宗交易))

Primary and Secondary Markets



Secondary Market (Cont.)

Order-Driven Markets (指令驱动市场)

- Trades are arranged using **rules** to match buy orders to sell orders.
- Exchanges and automated trading systems are examples of order driven markets.

Primary and Secondary Markets



Order-Driven Markets (Cont.)

Two sets of rules are used in order-driven markets

1. **Order matching rules:** establish an order precedence hierarchy
 - **Price priority:** the highest priced buy orders and the lowest priced sell orders are traded first.
 - **Display precedence:** displayed quantities at a given price have precedence over undisplayed quantities.
 - **Time precedence:** earliest arriving orders with the same display status at a given price are traded first.

Primary and Secondary Markets



Order-Driven Markets (Cont.)

2. **Trading Pricing rules:** determine the price after orders are created using order matching rules
 - **Uniform pricing rule:** all trades are executed at the same price that maximizes the trading volume.
 - **Discriminatory pricing rule:** the limit price of the order that first arrived is the trade price.
 - **Derivative pricing rule:** orders are batched together and matched at fixed points in time during the day at the midpoint of the best bid and ask quotes.

Practice



A trading system that matches buyers and sellers based on price and time precedence is most likely a(n):

- A. Quote-driven market
- B. Brokered market
- C. Order-driven market

Answer: C

In an order-driven market, buy orders and sell orders are matched up by the exchange according to order matching rules. In a quote-driven market, customers trade with dealers at bid and ask prices set by the dealers. In a brokered market, brokers organize trades among their clients.

Summary

- Importance: ☆☆
- Content:
 - Primary markets (IPO, seasoned offering, private placement, shelf registration, dividend reinvestment plan, right offering)
 - Secondary markets (call and continuous markets, quote-driven, order-driven, and brokered market)
- Exam tips:
 - 了解一级市场中的各类交易方式
 - 了解二级市场的不同结构和交易方式



Positions and Margin Transaction

Tasks:

- Compare positions an investor can take in an asset
- Calculate and interpret the leverage ratio, the rate of return on a margin transaction, and the security price at which the investor would receive a margin call



Positions and Margin Transaction

- A **position**(头寸) in an asset is the quantity of the instrument that an entity or a people owns or owes.
- **long position**(多头头寸) benefit from an **appreciation** in the prices of the assets or contracts owned.
 - Examples: purchase stocks/bonds/calls/futures/forwards, sell or write puts.
- **short positions**(空头头寸) benefit from a **decrease** in the prices of the assets or contracts sold.
 - Examples: sell short, purchase puts, sell or write calls/futures/forwards.



Positions and Margin Transaction

Selling Short (卖空/做空)

- Investor **borrow**s **stock** and sells it.
- Later, **repurchases the stock and returns it** to the lender (covers the short position).
- Short seller's **profit (loss)** is the original selling price minus the repurchase price (interest, commissions).
- Unlike a long position, the potential gains on a short position are limited to no more than 100 percent whereas the potential losses are unlimited.



Positions and Margin Transaction



Rules of Selling Short

- **Payments-in-lieu** (以付款代替): short sellers pay the security lenders all dividends or interest that they otherwise would have received had they not lent their securities.
- Short sellers must deposit the proceeds of the short sale with the security lenders as **collateral**.
- Security lenders invest the collateral in short-term securities, may return a portion of interest earned to the short sellers at rates called **short rebate rates**.

Positions and Margin Transaction



Leveraged Positions (杠杆头寸):

- **Buy on margin** (保证金交易/垫头交易): investors buy securities by borrowing some of the purchase price.
- The borrowed loan is called the **margin loan** (保证金贷款).
- The interest rate that the buyers pay for their margin loan is called the **call money rate** (保证金贷款利率).
- **Buyer's equity** is the portion of the security price that belongs to the buyer.
- **Financial leverage ratio** is the ratio of the value of the position to the value of buyer's equity.

Positions and Margin Transaction



Leveraged Positions

- **Initial margin requirement** (初始保证金): the minimum fraction of the purchase price that must be buyer's equity.
- **Maintenance margin requirement** (维持保证金): the minimum amount of equity in buyer's position.
- **Margin call** (追加保证金): if the value of the equity falls below the maintenance margin requirement, the buyer will receive a request for additional equity, or the position will be liquidated.

Positions and Margin Transaction



Leveraged Positions

Price triggering a margin call (**Margin Call Price**)

$$P_c = P_0 \frac{1 - IM}{1 - MM}$$

Where:

P_c = margin call price

P_0 = initial price

IM = initial margin requirement

MM = maintenance margin requirement

Positions and Margin Transaction



Calculating Returns and Leverage Ratio on Margin Position

> Example:

- An investor buys 1,000 shares of a stock on margin at a price of \$60 per share
- Initial margin requirement is 50% and margin loan rate is 2%
- Stock pays annual dividend of \$0.40 per share
- Commission is \$0.01 per share on purchase, sale
- One year later, investor sells stock at \$66 per share
- Calculate the leverage ratio and the investor's return on the margin position.

Positions and Margin Transaction



Calculating Returns and Leverage Ratio on Margin Position

> Solution:

Leverage ratio

$$= 1 / \text{minimum margin requirement}$$

$$= 1 / 0.50 = 2.0$$

Ignoring transactions costs and commissions, a return of +10% on the stock would result in a return of +20% on equity investment

Positions and Margin Transaction



Calculating Returns and Leverage Ratio on Margin Position

> Solution:

- Investor equity = $0.50 \times \$60 \times 1,000 = \$30,000$
- Commission on purchase = $\$0.01 \times 1,000 = \10
- Total investment = $\$30,010$

Positions and Margin Transaction



Calculating Returns and Leverage Ratio on Margin Position

> Solution:

- Dividends = $1,000 \times \$0.40 = \400
- Interest on loan = $\$30,000 \times 2\% = \600
- Sale proceeds = $\$66 \times 1,000 = \$66,000$
- Commission on sale = $\$0.01 \times 1,000 = \10
- Remaining equity =
- $\$66,000 + \$400 - \$30,000 - \$600 - \$10 = \$35,790$

Return on margin position =

$$(\$35,790 / \$30,010) - 1 = 19.26\%$$

Summary



- Importance: ☆☆☆
- Content:
 - Positions (long, short, leverage)
 - Short selling
 - Margin transaction
- Exam tips:
 - 理解和区别各类头寸
 - 掌握保证金交易的相关概念，能计算追加保证金价格和保证金交易的回报率

Order 11

Tasks:

- Compare execution, validity, and clearing instructions
- Compare market orders with limit orders

Order 11



Prices Quoted by Dealers(Market Makers 做市商)

- Bid price is the price at which a dealer is willing to buy a security.
- Ask/offer price is the price at which a dealer is willing to sell a security.
- Bid-ask spread is the difference between bid and ask price.
 - Bid-ask spreads are an implicit cost of trading.
- The best bid is the highest bid in the market.
- The best ask/offer is the lowest ask/offer in the market.

Order 11



Instructions Attached to Orders

- Execution instructions (执行指令) indicate how to fill the order.
- Validity instructions (时效指令) indicate when the order may be filled.
- Clearing instructions (结算指令) indicate how to settle the trade.

Order [1]



Execution Instructions (执行指令)

- **Market orders** (市价单) instruct the broker to buy or sell immediately at the **best current price**.
- **Limit orders** (限价单) instruct the broker to obtain the best price immediately available, but in no case accept a price higher than a specified limit price when buying or accepting a price lower than a specified limit price when selling.
 - A limit buy/sell order is **aggressively** priced when the limit price is high/low relative to the market prices.
 - **Marketable limit orders**: at least part of the order can trade immediately.

Order [1]



Execution Instructions

- **Comparison** of market orders with limit orders

| Market order | Limit order |
|--|--|
| Generally execute immediately | May not execute if: <ul style="list-style-type: none"> • The limit buy price is too low • The limit sell price is too high |
| May execute at unfavorable prices when: <ul style="list-style-type: none"> • the order is placed in a market for a thinly traded security • the order is large relative to the normal trading activity in the market | Generally execute at better prices than do market orders |

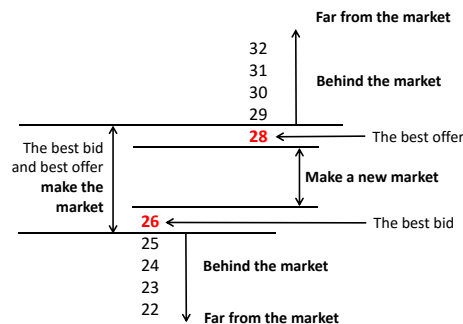
Order [1]



Execution Instructions

- **Make the market**: a limit buy order placed at best bid, or a limit sell order placed at best ask. The order might not be filled.
- **Make a new market**: a limit buy/sell order placed between the best bid and the best ask.
- **Behind the market**: a limit buy order placed below the best bid, or a limit sell order placed above the best ask.
- **Far from the market**: a limit buy order placed considerably below the best bid, or a limit sell order placed considerably above the best ask.

Order [1]



Order I1



Execution Instructions

- **All-or-nothing orders** can only trade if the entire sizes can be traded.
- **Hidden orders (隐藏单)** are exposed only to broker/exchange.
 - **Iceberg orders (冰山指令)** expose only the display size, the rest of the orders is hidden from the public.

Practice



Currently, the market in a stock is "54.62 bid, offered at 54.71". A new sell limit order is placed at 54.62. this limit order is said to:

- A. Take the market
- B. Make the market
- C. Make a new market

Answer: A

This order is said to take the market. The new sell order is at 54.62, which is at the current best bid. Therefore, the new sell order will immediately trade with the current best bid and is taking the market.

Summary



- **Importance:** ★★★
- **Content:**
 - Execution, validity, and clearing instructions
 - Market, limit, all-or-nothing, hidden order
 - Make the market, make a new market, behind the market, far from the market
- **Exam tips:**
 - 了解和区别三种指令
 - 重点掌握和比较市价单和限价单

Order I21 Market Regulation

Tasks:

- **Compare** execution, validity, and clearing instructions
- **Describe** characteristics of a well-functioning financial system
- **Describe** objectives of market regulation

Order 121



Validity Instructions (时效指令)

- **Day orders** (当日有效单) expire if unfilled by the end of the trading day.
- **Good-till-cancelled** orders are valid until the orders are filled.
- **Immediate-or-cancel(fill-or-kill)** orders cancel immediately if they cannot be filled in part or in whole.
- **Good-on-close** orders can only be filled at the close of trading.
- **Good-on-open** orders can only be filled at the open of trading.

Order 121



Validity Instructions

- **Stop orders** (止损单) cannot be filled until the stop price condition has been satisfied.
 - For a stop sell order, the execution is suspended until a trade occurs **at or below** the specified stop price.
 - For a stop buy order, the execution is suspended until a trade occurs **at or above** the specified stop price.
- Situations where stop orders are used
 - Traders hope to stop losses on positions
 - Traders believe that a security is undervalued/overvalued but is unwilling to trade without market confirmation.
- Stop orders reinforce market momentum

Practice 1



You have placed a sell market-on-open order – a market order that would automatically be submitted at the market's open tomorrow and would fill at the market price. Your instruction, to sell the shares at the market open, is a(n):

- A. Execution instruction
- B. Validity instruction
- C. Clearing instruction

Answer: B

An instruction regarding when to fill an order is considered a validity instruction.

Practice 2



Jim White has sold short 100 shares of Super Stores at a price at a price of 42 per share. He has also simultaneously placed a "good-till-cancelled, stop 50, limit 55 buy" order. Assume that if the stop condition specified by White is satisfied and the order becomes valid, it will get executed. Excluding transaction costs, what is the maximum possible loss that White can have?

- A. 800
- B. 1,300
- C. Unlimited

Answer: B

The maximum loss is 1,300. if the stock price crosses 50, the stop buy order will become valid and will get executed at a maximum limit price of 55. the maximum loss per share is 13=55-42

Well-Functioning Financial Systems



- Characteristics of a well functioning financial system:
 - **Complete markets**: instruments available to serve the purposes of people/entities.
 - **Operational efficient**: low transaction costs.
 - **Informationally efficient**: security prices reflect their fundamental values(intrinsic values).
 - **Allocationally efficient**: resources go where they are most valuable.
 - **Financial intermediaries** facilitate transactions.

Market Regulation



- The **Objectives** of market regulation include:
 - Protect unsophisticated investors
 - Require minimum standards of competency
 - Prevent trading on inside information
 - Require common financial reporting standards
 - Require minimum levels of capital

Summary



- **Importance**: ☆☆☆
- **Content**:
 - Validity instructions
 - Stop order
 - Characteristics of well-functioning financial system
 - Market regulation
- **Exam tips**:
 - 理解各类时效指令，重点掌握止损单
 - 了解功能良好的金融系统的特征，及市场管制的目的

Fundamentals of Security Indices



Tasks:

- **Describe** a security market index
- **Calculate** and **Interpret** the value, price return, and total return of an index
- **Describe** the choices and issues in index construction and management
- **Describe** rebalancing and reconstitution of an index

Fundamentals of Security Indices



Definition of Security Market Indices

- A **security market index** represents a given security market, market segment, or asset class.
 - The individual securities included in a security index are known as **constituent securities** (成分证券).
 - A **price return index** (价格回报) reflects only the prices of constituent securities.
 - A **total return index** (总回报) reflects not only the prices of the constituent securities but also the reinvestment of all income received since inception.
 - As time passes, the value of the total return index will exceed the value of the price index.

Fundamentals of Security Indices



The Value and Return of an Index

- The value of a price return index is calculated as:

$$V_{PRI} = \frac{\sum_{i=1}^N n_i P_i}{D}$$

Where:

- V_{PRI} = The value of the price return index
- n_i = The number of units of constituent security i held in the index portfolio
- P_i = The unit price of constituent security i
- D = The value of the divisor

- The divisor is a number initially chosen at inception so that the index has a convenient initial value, such as 1000.

Fundamentals of Security Indices



Calculation of Single-Period Price Returns

$$PR_t = \frac{V_{PRI,t} - V_{PRI,0}}{V_{PRI,0}}$$

- PR_t = The price return of the index portfolio
- $V_{PRI,t}$ = The value of the price return index at the end of the period
- $V_{PRI,0}$ = The value of the price return index at the beginning of the period

Or: $PR_t = w_1 PR_{1t} + w_2 PR_{2t} + \dots + w_N PR_{Nt}$

- PR_{it} = the price return of constituent security i
- w_i = the weight of security i
- N = The number of securities in the index

The price return of each constituent security:

$$PR_{it} = \frac{P_{i,t} - P_{i,0}}{P_{i,0}}$$

Fundamentals of Security Indices



Calculation of Single-Period Total Returns

$$TR_t = \frac{V_{PRI,t} - V_{PRI,0} + Inc_t}{V_{PRI,0}}$$

- TR_t = The total return of the index portfolio
- $V_{PRI,t}$ = The value of the price return index at the end of the period
- $V_{PRI,0}$ = The value of the price return index at the beginning of the period
- Inc_t = The total income from all securities in the index

Or: $TR_t = w_1 TR_{1t} + w_2 TR_{2t} + \dots + w_N TR_{Nt}$

- TR_{it} = the total return of constituent security i
- w_i = the weight of security i
- N = The number of securities in the index

The total return of each constituent security:

$$TR_{it} = \frac{P_{i,t} - P_{i,0} + Inc_{it}}{P_{i,0}}$$

Fundamentals of Security Indices



Calculation of Index Values over Multiple Time Periods

$$V_{PRIT} = V_{PRIO} (1 + PR_{I1}) (1 + PR_{I2}) \dots (1 + PR_{IT})$$

V_{PRIO} = The value of the price return index at inception

V_{PRIT} = The value of the price return index at time T

PR_{It} = The price return on the index over period t, t = 1, 2, ..., T

$$V_{TRIT} = V_{TRIO} (1 + TR_{I1}) (1 + TR_{I2}) \dots (1 + TR_{IT})$$

V_{TRIO} = The value of the total return index at inception

V_{TRIT} = The value of the total return index at time T

TR_{It} = The total return on the index over period t, t = 1, 2, ..., T

Fundamentals of Security Indices



Choices and Issues in Index Construction and Management

- In constructing a security market index, provider decide:
 - Which **target market** should the index represent?
 - Which **securities** should be selected from that target market?
 - How much **weight** should be allocated to each security in the index?
 - When should the index be **rebalanced**?
 - When should the security selection and weighting decision be **re-examined**?

Fundamentals of Security Indices



Rebalancing and Reconstitution

- **Rebalancing** (权重再调整) refers to adjusting the weights of the constituent securities in the index.
- **Reconstitution** (指数重建) is the process of changing the constituent securities in an index.
 - Constituent securities that no longer meet the criteria are replaced with securities that meet the criteria.
 - Indices are reconstituted to reflect changes in the target market (bankruptcies, de-listings, mergers, acquisitions, etc).

Summary



- **Importance:** ☆
- **Content:**
 - Definition of security market indices
 - Value and returns of an index
 - Choices and issues in index construction and management
 - Rebalancing and reconstitution
- **Exam tips:**
 - 了解证券市场指数的定义，指数构建和管理过程中涉及的选择和问题
 - 能计算指数的价格回报和总回报
 - 理解指数权重再调整和指数重建的概念

Index Weighting I

Tasks:

- **Compare** the different weighting methods used in index construction
- **Calculate** and **Analyze** the value and return of an index given its weighting methods

Index Weighting

- Index weighting methods include:
 - Price weighting
 - Equal weighting
 - Market-capitalization weighting
 - ✓ Float-adjusted market cap
 - ✓ Free-float-adjusted market cap
 - Fundamentally weighting

Index Weighting

➤ Price Weighting (价格加权)

- The index value is the **arithmetic average** of security prices.
- The index is matched by buying **an equal number of shares of each security** in the index.
- Highly priced securities have a **greater influence** on index value.
- When a **stock split** occurs, the divisor is adjusted so that the index value is maintained unchanged.
- The primary advantage is its **simplicity**, the main disadvantage is that the weights are **arbitrarily** determined by market prices.
- **DJIA** is price-weighted index.

Index Weighting

➤ Price Weighting

value of a price-weighted index = $\frac{\text{sum of security prices}}{\text{number of securities in index adjusted for splits}}$

| Stock | Nov. 30 | | | Dec. 31 | | |
|--------------|---------|--------------|--------------|---------|--------------|--------------|
| | price | Nr of shares | Market value | price | Nr of shares | Market value |
| A | 20 | 300 | 6,000 | 22 | 300 | 6,600 |
| B | 30 | 200 | 6,000 | 27 | 200 | 5,400 |
| C | 40 | 100 | 4,000 | 44 | 100 | 4,400 |
| Total | 90 | | 16,000 | 93 | | 16,400 |

Beginning value of the index = $90/3=30$
 Ending value of the index = $93/3 = 31$
 Return of the index = $(31-30)/30 = 3.33\%$

Index Weighting



> Equal Weighting (Un-weighting) (相同加权)

- Each constituent security has an **equal weight**
- The index is matched by investing **equal dollar amount** in each stock
- Index return is the **arithmetic mean of HPRs** on index stocks
- The weights are **arbitrarily** assigned by the index provider.
- The primary advantage is its **simplicity**.
- The disadvantages include: 1) large-cap stocks are **under-weighted**, small-cap stocks are **over-weighted**; 2) requiring **rebalancing** as prices change.
- Value-Line Composite Average** is equal weighted index.

Index Weighting



> Equal Weighting

return on an equal weighted index = $\frac{\text{sum of security returns}}{\text{number of securities in index}}$

| Security | Initial price | Current price | Security return |
|----------|---------------|---------------|-----------------|
| X | 30 | 27 | -10% |
| Y | 10 | 15 | 50% |
| Z | 20 | 22 | 10% |

Arithmetic mean = $(-10\% + 50\% + 10\%) / 3 = 16.67\%$

Initial index value = 100

Current index value = 116.67

Practice 1



Which of the following index weighting methods requires an adjustment to the divisor after a stock split?

- A. Price weighting
- B. Fundamental weighting
- C. market-capitalization weighting

Answer: A

In the price weighting method, the divisor must be adjusted so the index value immediately after the split is the same as the index value immediately prior to the split.

Practice 2



If the price return of an equal-weighted index exceeds that of a market capitalization weighted index comprised of the same securities, the most likely explanation is:

- A. Stock split
- B. Dividend distributions
- C. Outperformance of small market capitalization stocks

Answer: C

The main source of return differences arises from outperformance of small cap securities or underperformance of large cap securities.

Summary

- Importance: ☆☆☆
- Content:
 - Price weighting
 - Equal weighting
- Exam tips:
 - 掌握并比较各类指数加权方法的特征
 - 能计算各类加权指数的值和回报率



Index Weighting I21

Tasks:

- Compare the different weighting methods used in index construction
- Calculate and Analyze the value and return of an index given its weighting methods



Index Weighting

- Market-Capitalization Weighting (市值加权)
 - The weight is determined by dividing a stock's market capitalization by the total market capitalization of the index.
 - The index is matched by setting the weight of each security equal to its **percentage of the total market value of index**.
 - Firms with larger market capitalizations have a **greater influence** on the index's value
 - **Momentum tilt (动量倾斜)**: Overpriced securities are over-represented.
 - **S&P 500**, and **Wilshire 5000** are market-cap weighted indexes



Index Weighting

➤ Market-Capitalization Weighting

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

| Stock | Nov. 30 | | | Dec. 31 | | |
|--------------|-----------|--------------|---------------|-----------|--------------|---------------|
| | price | Nr of shares | Market value | price | Nr of shares | Market value |
| A | 20 | 300 | 6.000 | 22 | 300 | 6.600 |
| B | 30 | 200 | 6.000 | 27 | 200 | 5.400 |
| C | 40 | 100 | 4.000 | 44 | 100 | 4.400 |
| Total | 90 | | 16.000 | 93 | | 16.400 |

Base year (Nov. 30) index value = 100

Current index value = $(16.400/16.000) \times 100 = 102.5$

Index return = $102.5/100 - 1 = 2.5\%$



Index Weighting



➤ Float-Adjusted Market-Cap Weighting (流通市场加权)

- The weight is determined by adjusting its market capitalization for its **market float**, which is the number of shares available to the investing public.
 - ✓ E.g., excluding shares held by controlling shareholders, strategic investors.
- Free-float-adjusted** market capitalization weighting further reduce the number of shares by excluding shares not available to foreign investors

Index Weighting



➤ Fundamental Weighting (基本面价值)

- The index uses measures, such as *book value, cash flow, revenues, dividends, and number of employees* to determine the weight.
- The main advantage is that it avoids the bias of market capitalization-weighted indexes toward performance of shares of overvalued firms and away from performance of shares of undervalued firms.
- The indices have a “**value**” tilt (价值倾斜), and “**contrarian**” effect (逆向效应).

Practice



A float-adjusted market capitalization weighted index weights each of its constituent securities by its price and:

- Its trading volume
- The number of its shares outstanding
- The number of its shares available to the investing public

Answer: C

“Float” is the number of shares available for public trading.

Summary



➤ Importance: ☆☆☆

➤ Content:

- Market cap, float-adjusted market cap, free float adjusted market cap weighting
- Fundamental weighting

➤ Exam tips:

- 掌握并比较各类指数加权方法的特征
- 能计算各类加权指数的值和回报率

Uses and Types and Security Market Indices

Tasks:

- Describe uses of security market indices
- Describe types of equity indices
- Describe types of fixed-income indices
- Describe indices representing alternative investments

Uses and Types and Security Market Indices

Uses of Security Market Indices

- Reflection of market sentiment
- Performance benchmark
- Measure of market return
- Calculate beta
- Calculate expected and risk-adjusted returns
- Model portfolio for index funds

Uses and Types and Security Market Indices

Types of Equity Indices

- **Broad Market Indices** represent an entire equity market.
 - Shanghai Stock Exchange Composite Index (SSE), The Russell 3000.
- **Multi-Market Indices** comprise indices from different countries.
 - MSCI International Equity Indices
- **Fundamental Weighting in Multi-market indices** weight the securities within each country by market capitalization and weight each country in proportion to its relative GDP.
- **Sector Indices** represent different economic sectors
- **Style Indices** represent securities classified according to market capitalization, value, growth, etc.

Uses and Types and Security Market Indices

Fixed Income Indices

- **Issues with the Construction of Fixed Income Indices**
 - **Broad universe**
 - ✓ Fixed-income securities can be classified along many dimensions: issuer, maturity, currency, credit quality, etc.
 - **High turnover**
 - ✓ Securities mature
 - **Dealer markets and illiquidity**
 - ✓ Index providers rely on dealers for prices, or must estimate the prices by themselves.

Uses and Types and Security Market Indices



Alternative Investment Indices

- **Commodity Indices** consist of future contracts on commodities.
 - Different weighting methods.
 - The performance of commodity indices can be quite different from their underlying commodities.

Uses and Types and Security Market Indices



Alternative Investment Indices (Cont.)

- **Real Estate Indices** are categorized as appraisal indices, repeat sales indices, and REIT indices
- **Hedge Fund Indices** reflect returns on hedge funds.
 - Index providers rely on the voluntary cooperation of hedge funds.
 - The potential for survivorship bias.

Practice 1



Uses of market indices do not include serving as a:

- A. Measure of systematic risk
- B. Basis for new investment products
- C. Benchmark for evaluating portfolio performance

Answer: A

Security market indices are used as proxies for measuring market or systematic risk, not as measures of systematic risk.

Practice 2



Which of the following statements regarding fixed-income indices is most accurate?

- A. Liquidity issues make it difficult for investors to easily replicate fixed income indices
- B. Rebalancing and reconstitution are the only sources of turnover in fixed income indices
- C. Fixed income indices representing the same target market hold similar number of bonds

Answer: A

The large number of fixed income securities-combined with the lack of liquidity of some securities-make it costly and difficult for investors to replicate fixed income indices.

Summary



- **Importance:** ☆ ☆
- **Content:**
 - Uses of security market indices
 - Types of equity indices
 - Fixed income indices
 - Alternative investment indices
- **Exam tips:**
 - 了解证券市场指数的用途
 - 了解和区别不同权益指数
 - 了解固收指数和另类投资指数的特征



Concepts of Market Efficiency



Tasks:

- **Describe** market efficiency and related concepts
- **Distinguish** between market value and intrinsic value
- **Explain** factors that affect a market's efficiency



Concepts of Market Efficiency



- **An informationally efficient market** is a market in which asset prices reflect new information quickly and rationally.
 - A **passive investment strategy** is preferred to an **active investment strategy** due to lower costs.
 - Prices react only to the “**unexpected**” information.



Concepts of Market Efficiency



- **Market Value** is the price at which an asset can currently be bought or sold.
- **Intrinsic value**(内在价值) is the value if investors had a complete understanding of asset's investment characteristics.
 - In an efficient market, market prices accurately reflect intrinsic values.

