金程教育 GOLDEN FUTURE

专业·领先·增值

专业来自101%的投入!

CFA 一级培训项目

Financial Products

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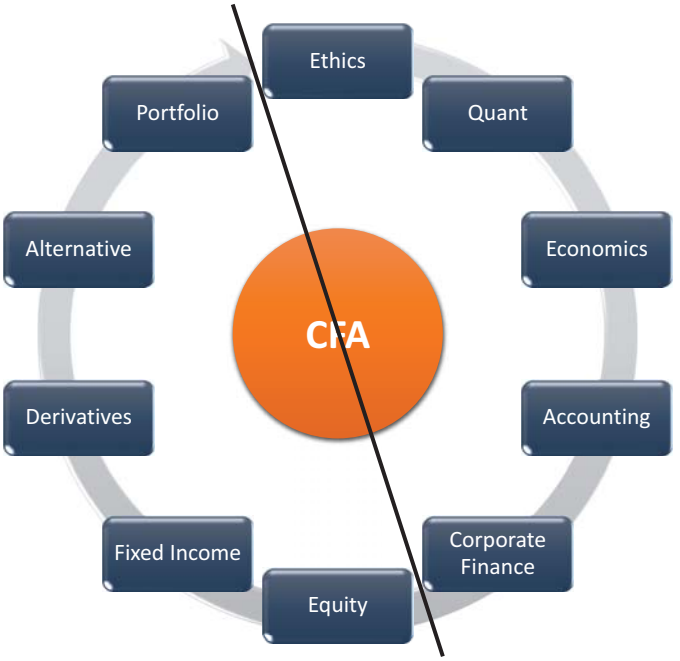
CFA、FRM、RFP、Mensa

职称：金程教育资深培训师、金程教育金融研究院副院长、高级口译、 Global Association of Risk Professionals(GARP)会员

教育背景：美国哥伦比亚大学TEFL,先后求学于上海交大高级金融学院和美国加州州立大学洛杉矶分校(UCLA)并获硕士学位。本科毕业于上海交通大学金融商务英语专业。Mensa（世界顶级高智商俱乐部门萨）会员

工作经验：曾就职于银行、对冲基金和证券公司任管理和投资研究工作。现任某对冲基金研究总监，负责证券的投资研究、市场趋势判断和金融产品的设计创新



Equity

1. Securities Markets

Well-functioning securities market

1. Timely and accurate information
2. Liquidity: marketability, and price continuity
3. Internal efficiency: low transaction costs
4. External efficiency: prices adjust rapidly to new information

Primary capital markets

- Definition: where newly issued securities are traded
- Underwriter: stocks or bonds are sold with the help of underwriters. An underwriter is usually an investment bank.
- An underwriter guarantees the issue price by purchasing the securities first.
- New equity issues:
  - IPO: initial public offerings
  - Seasoned issues

Secondary financial markets

- Secondary markets are places for previously issued securities.

- Secondary markets provide liquidity.
- The greater liquidity the securities have, the more willing investors are to buy/sell the securities.

Stock exchanges

- NYSE: The New York Stock Exchange
- NASDAQ: National Association of Securities Dealers Automated Quotation
- London, Tokyo, Frankfurt Stock Exchanges, the Paris Bourse.
- OTC: over-the-counter market, in which investors negotiate directly with the dealers. They trade all securities not listed on one of the registered exchanges.

Types of orders

- Market orders: orders to buy/sell at the best price available.
- Limit buy orders: orders to be place below the current price.
- Limit sell orders: placed above the current price.
- Stop loss orders: suppose you own a stock currently selling for $40. You fear that it may drop in price. You place a stop loss sell order at $35. If the price drops to this level, it will be sold.

Short sales

For a short sale, the short seller:

- Simultaneously borrows and sells securities,
- Return the securities to the original owner at later time.

Margin transaction

- Margin transaction involves buying securities with borrowed money from brokerage firms.
- Initial margin requirement: the initial required equity position. If it is set to 40%, that means the investor must put up 40% of the funds, and the brokerage firm could lend the 60% rest.

Return on margin trade

- Assume that an investor purchases 100 shares of a stock for $75 per share (total cost of $7,500). Compute the investor's return if the stock is sold for $150 per share and the transaction was:

1. 100% cash;
   – The investor would have a return:

$$\frac{15,000-7,500}{7,500}=100\%$$

Return on margin trade

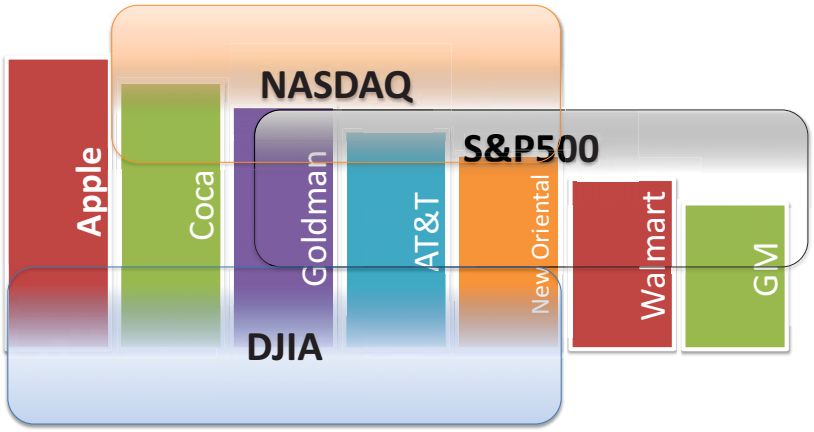
- Assume that an investor purchases 100 shares of a stock for $75 per share (total cost of $7,500). Compute the investor's return if the stock is sold for $150 per share and the transaction was:

2. A margin purchase with margin requirement of 60%.
- The investor would have a return:

$$\frac{(\underset{\text{revenue}}{15,000}-\underset{\text{loan}}{3,000})-\underset{\text{principal}}{4,500}}{\underset{\text{principal}}{4,500}}=167\%$$

2. Security Indexes

Compile an index



Price-weighted Index / Value-weighted Index

	As of December 31, 2006			As of January 31, 2007		
	Share Price	Number of Shares Outstanding	Total Market Value	Share Price	Number of Shares Outstanding	Total Market Value
Stock X	10	3,000	30,000	20	3,000	60,000
Stock Y	20	1,000	20,000	15	1,000	15,000
Stock Z	60	500	30,000	40	500	20,000
Total	90	4,500	80,000	75	4,500	95,000

Price-weighted Index

- December 31, 2006:
  Ave share price = (10+20+60)/3=30
- January 31, 2007:
  Ave share price = (20+15+40)/3=25
- The index rose by: (25-30) / 30 = -16.7%

- Index representative: Dow Jones Industrial Average (DJIA), and the Nikkei
- The index is biased downward because large firms tend to split their shares more often, decreasing their weights in the index

Value-weighted Index

- December 31, 2006:
  Total market value = 80,000
- January 31, 2007:
  Total market value = 95,000
- Value-weighted Index of 2007 =
  95000/80000 × 100 = 118.75
- The index rose by: (118.75-100) / 100 = 18.75%

Treat Y2006 as a base year = 100

- Index representative: Standard & Poor's 500
- The index is biased because firms with greater market cap have a greater impact on the index

Price-weighted Index

- Calculate the price-weighted and value-weighted index values if Stock A doubles in price, and if Stock C doubles in price.

Company	Number of shares	Stock price	Capitalization
A	100	$100	$10,000
B	1,000	$10	$10,000
C	20,000	$1	$20,000

Price-weighted Index

- The price-weighted index: (100+10+1) / 3 = 37
- If Stock A doubles in price, the index value=
  (200+10+1) / 3 = 70.33
- If Stock C doubles in price, the index value=
  (100+10+2) / 3 = 37.33

Company	Number of shares	Stock price	Capitalization
A	100	$100	$10,000
B	1,000	$10	$10,000
C	20,000	$1	$20,000

Value-weighted Index

- Original market capitalization (set as base index 100):
  $100×100 + $10×1000 + $1×20000 = $40,000
- If Stock A doubles in price to $200, the new index:

$$\frac{\$200\times100+\$10\times1{,}000+\$1\times20{,}000}{\$40{,}000}\times100=125$$

- If Stock C doubles in price to $2, the new index:

$$\frac{\$100\times100+\$10\times1{,}000+\$2\times20{,}000}{\$40{,}000}\times100=150$$

Company	Number of shares	Stock price	Capitalization
A small-cap	100	$100	$10,000
B small-cap	1,000	$10	$10,000
C large-cap	20,000	$1	$20,000

Global equity indexes

- Financial Times World Indexes: based on 2461 stocks from 30 countries (1986 base value = 100);
- MSCI: Morgan Stanley Capital International Indexes, made up of 3 international, 19 national, and 38 international industry indexes;
- Dow Jones World Stock Index: 2,200 companies from the globe.
- When securities of different countries are combined into a global investment portfolio, the risk reduction due to diversification can be significant because of their lower correlations.

3. Equity Valuation

Top-down approach in security valuation

Step 1: Macro-economy analysis

Fiscal policy: affect the rate of economic growth

- Tax cuts: encourage spending and speed up the economy
- Tax increases: discourage spending
- Government spending: creates jobs, and increase demands

Top-down approach in security valuation

Step 1: Macro-economy analysis

Monetary policy: used by the central bank to manage economic growth

- Decrease money supply: cause interest rate to rise
- Increase money supply: cause interest rate to drop

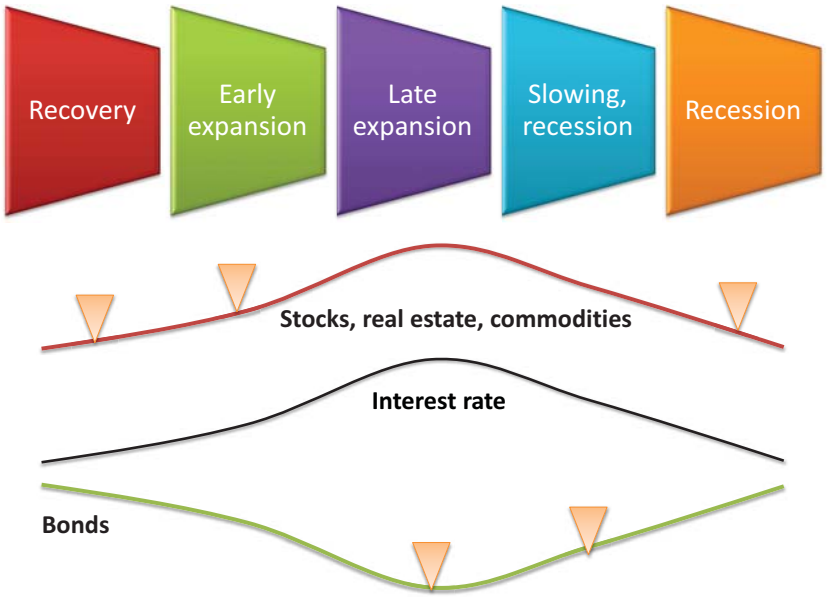
- Inflation results from increasing the money supply too fast
- Rising i: reduce the demand for investment funds

Top-down approach in security valuation

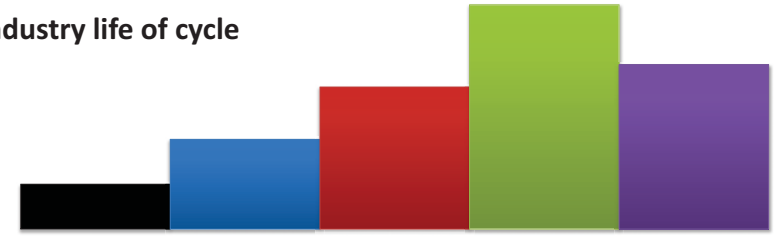
Step 1: Macro-economy analysis

Five stages of a business cycle:

1. Recovery: attractive investments: cyclicals and commodities equities
2. Early expansion: real estate equities
3. Late expansion: bonds and interest-sensitive stocks
4. Slowing, entering recession: bonds and interest-sensitive stocks
5. Recession: commodities and stocks



Industry life of cycle



Pioneering	Rapid growth	Mature growth	Market maturity	Deceleration and decline
Low sales, profit, demand; high R&D costs	Demand grows fast, limited competition, high sales growth and profit margin	Above normal sales growth, competitors enter, declined profit margin	Average sales growth rate, fierce competition, slim profit margin	Low demands, declining profit margin
VR	Wearables	Education	PC	Shipping

Top-down approach in security valuation

Step 2: Industry analysis

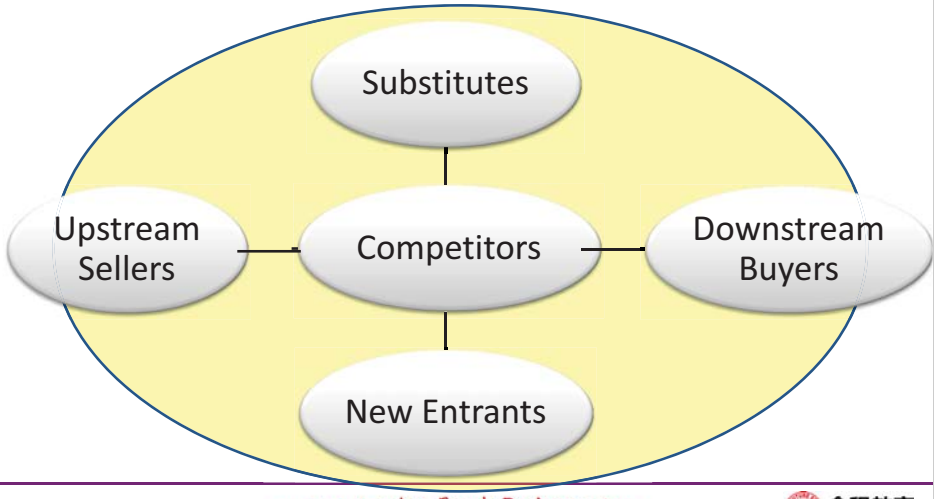
- Herfindahl index: measure the industry concentration

- Eg. An industry has four firms with market shares of 40%, 30%, 20%, and 10%. Calculate the 3-firm concentration ratio and the Herfindahl index for this industry.
- The 3-firm concentration ratio = 90%
- The HFI is: $0.4^2+0.3^2+0.2^2+0.1^2 = 0.3$

Top-down approach in security valuation

HFI	Industry Competition
HFI<0.1	Lack of concentration
0.1<HFI<0.18	Some concentration
HFI>0.18	High concentration

Porter's five competition factors



Top-down approach in security valuation

Step 3: Company analysis

- Growth stock: earns higher returns than other similar stocks
- Growth stocks are often overpriced

- Value stock: is used to describe stocks that are priced low in relation to their current earnings

Top-down approach in security valuation

Step 3: Company analysis

- Defensive stock: will not decline as much as the market when the overall market declines, such as utility companies and retail chains.
- Cyclical stock: with rates of return that tend to follow the business cycle, such as steel, automobile, and shipping.
- Speculative stock: has assets that are very risky, but the assets have the potential to generate large earnings, such as diamond mining, nova drug, oil exploration, real estate, etc

Forex

1. Forex Markets

Currency appreciation & depreciation

- Money supply & demand: When the supply (demand) of a currency increases, its exchange rate will decrease (increase).
- Eg. The US Fed usually buys dollars when the value of a dollar falls and sell dollars when the value of a dollar rises.
- And an increase in the expected future exchange rate for a country's currency will increase demand for that currency.

Currency appreciation & depreciation

- Interest rate: If the euro rate of interest rises relative to the USD rate of interest, demand for euro will increase, and thus its exchange rate will rise against the USD.
- Appreciate and depreciate: how about 140 yen/euro changes to 145 yen/euro?

Direct/indirect quotes

- Margin deposit trade
  - Assume the market rate changes from 7.7000 RMB/USD to 7.6800 RMB/USD (up 200 basis points), only a change of 0.26% in percentage, but investors can gain more than that in the forex market.
- Direct quotes: Domestic Currency /FC
- Indirect quotes: FC/DC

Bid-Ask spread

- Bid price: the price a dealer will buy for FC
- Ask price: the price a dealer will sell FC

Bid-Ask spread

- Eg. Consider the following quotations: the bid of 1.6625 USD/GBP and the ask of 1.6635 USD/GBP are listed. Calculate the bid-ask spread as a direct quote from the perspective of a British banker.
- Now we switch the bid-ask spread to a direct quote from the British perspective (GBP/USD), which is an indirect quote to a US investor.
- 1/1.6625 = 0.60150 GBP/USD Ask
- 1/1.6635 = 0.60114 GBP/USD Bid
- Spread = (ask-bid) / bid

Cross rate

- Eg. The spot exchange rate between the Swiss franc (CHF) and the USD is 1.7799 CHF/USD, and the spot exchange rate between the New Zealand dollar (NZD) and the USD is 2.2529 NZD/USD. Calculate the CHF/NZD spot rate.
- Answer: [1.7799 CHF/USD] / [2.2529 NZD/USD] = 0.79005 CHF/NZD

Spot and forward market

- A US firm is obligated to make a future payment of CHF100,000 in 60 days. To manage its exchange rate risk, the firm contracts today to buy the Swiss franc 60 days in the future at 1.7530 CHF/USD. The current exchange rate is 1.7799 CHF/USD. How much would the US firm gain or lose if 60 days later, the spot market rate is 1.6556 CHF/USD?

1. Without the forward contract: the firm has to use 100,000/1.6556 = 60,401USD in 60 days.
2. With the forward contract: the firm only has to use 100,000/1.7530 = 57,045USD in 60 days.
3. The current exchange rate makes no sense.

Spot and forward market

- Forward Discount: A currency will be cheaper in the future.

  Forward rate < spot rate
- Forward Premium: A currency will be more expensive in the future.

  Forward rate > spot rate

Derivatives

1. Forward & Futures

Long and Short

- Party A agrees to long a Treasury bill from Party B (short) 30 days from now at a price of $1000.
- Suppose1: in 30 days: the spot price is traded at $900; The Long has to pay $100 to the Short.
- Suppose2: in 30 days : the spot price is traded at $1100. The Short has to pay $100 to the Long.

- Spot > Forward: long receives payment
- Spot < Forward: short receives payment

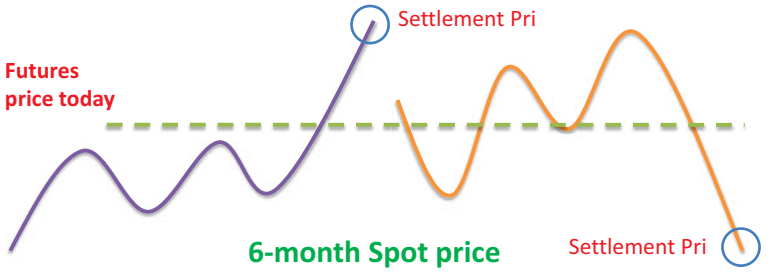
- Futures is a zero-sum game. Winning or loss depends on traders' speculation.

Features of futures

- Default risk: one party fails to perform his payment.
- Cash settlement: the losing party is obligated to pay the cash amount to the winning party.
- Delivery: to deliver the actual goods.
- Futures contracts are highly standardized and traded on organized exchanges.
- Tick size: the basic price movement
- Daily price limit: limit up, limit down, locked limit
- Margin and leverage: the money deposited by both the long and the short, no interest charges.

Speculators and hedgers

- Hedge: use futures contracts to reduce exposure to price changes in the asset.
- Eg. A wheat farmer who will sell wheat produce in 6 months short a 6-month wheat futures, in order to cut the uncertainty about the price of wheat at harvest time.



2. Option

An option contract

- Option premium 权利金
- Strike price 执行价格
- Spot price 现货价
- Exercise date 执行日
- Call option 看涨期权
- Put option 看跌期权

Call Option 看涨期权

A – Call Long 买方 **B – Call Short 卖方**

- Jan 1: future copper 3-month strike price = $1000/ton.
- A bought the option for $50 and B sold the option for $50.

Premium

- Apr 1: copper spot price = $1200/ton.
- A can buy copper from B at $1000 and then sell it at spot market at $1200, winning $150.
- B had to buy spot copper at $1200 and sell it to A at $1000, losing $50.
- If spot price declined below $1000/ton, A can renounce the option, only losing $50; B thus can win $50 premium.

Put Option 看跌期权

A – Put Long 买方 **B – Put Short 卖方**

- Jan 1: future copper 3-month strike price = $1000/ton.
- A bought the option for $50 and B sold the option for $50.

Premium

- Apr 1: copper spot price = $800/ton.
- A can buy copper at $800 from the spot market and then sell it to B at $1000, winning $50.
- B had to buy it at $1000 and he can then choose to sell it at spot market at $800, losing $50.
- If spot price rose above $1000/ton, A can renounce the option, only losing $50; B thus can win $50 premium.

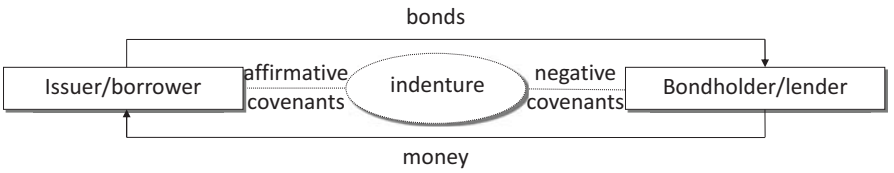
Long and short

	Long	Short
Right	max risk is the option premium and his profit is limitless Call: if S>X, profit=S-X-C Put: if S<X, profit=X-S-P	No right whatsoever Call: if S<X, profit=C Put: if S>X, profit=P
Obligation	No obligation whatsoever No deposit requirement	max profit is the option premium and his risk is limitless pay a deposit of 5% or so

Fixed Income

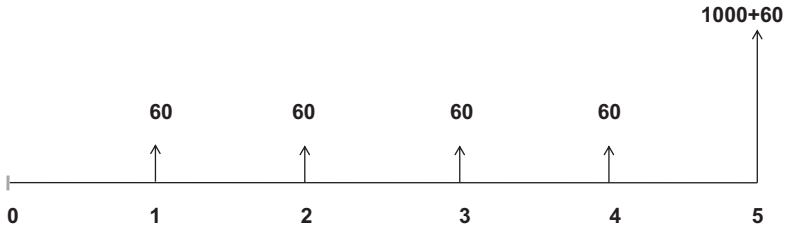
What is fixed income security?

- Definition : A financial obligation of an entity that *promises* to pay a special sum of money at specified future dates.
- Indenture: The contract that specifies all the rights and obligations of the issuer and the owners of a fixed income security.



Par, coupon, maturity, YTM

- A bond has a par value of $1000, a 6% annual coupon, and five years to maturity.

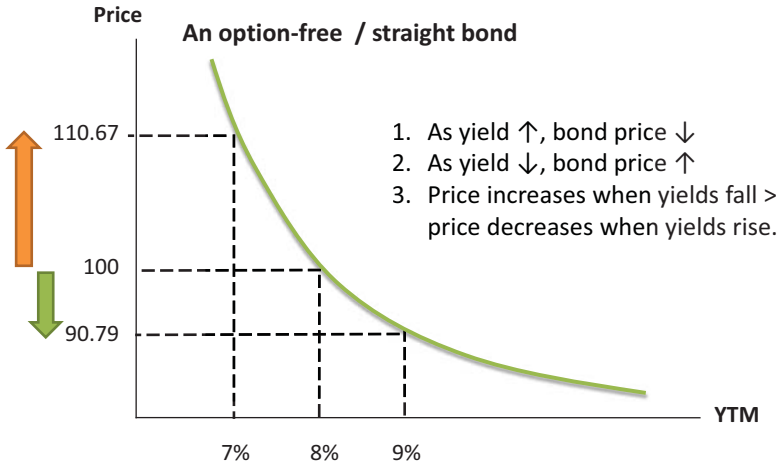


Bond price and YTM

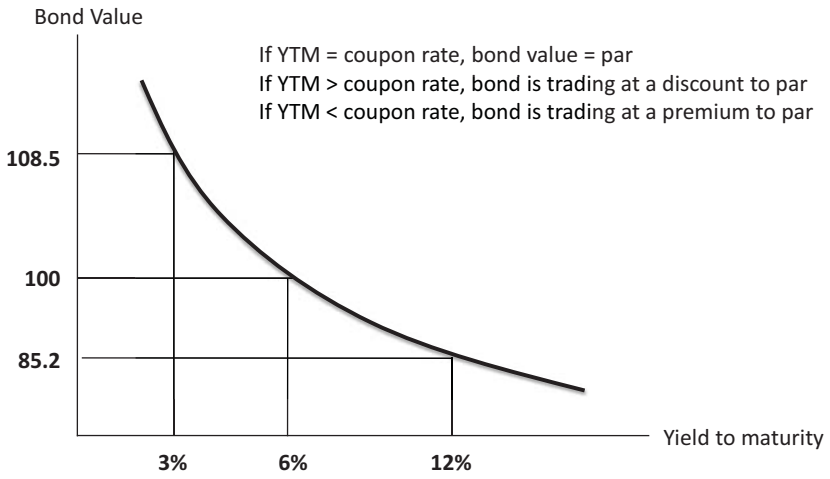
$$Bond\ price = \frac{CPN_1}{(1+\frac{YTM}{2})} + \frac{CPN_2}{(1+\frac{YTM}{2})^2} + \cdots + \frac{CPN_{2N}+Par}{(1+\frac{YTM}{2})^{2N}}$$

- Consider a 20-year, $1000 par value bond, with a 6% coupon rate (semiannual payments) that is currently trading at $802.07. Calculate the YTM.
- PV= -802.07, N=40, FV=1000, PMT=30
- CPT: I/Y = 4% (semiannual discount rate)
- YTM =2*4% = 8%

Price-yield curve for a 8%, 20-year bond



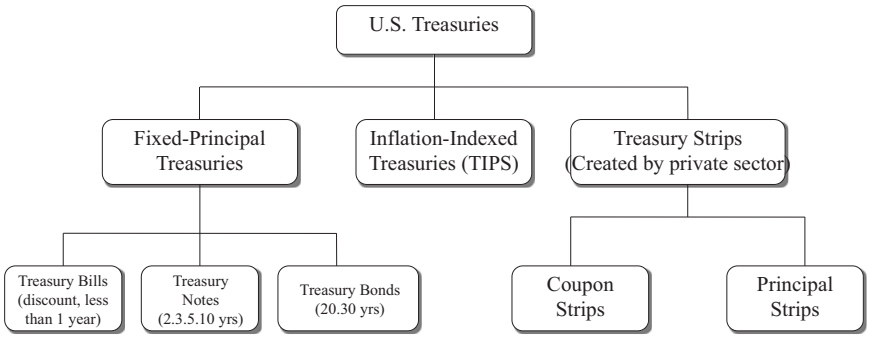
The Price-Yield Profile



Zero coupon bond

- Compute the value of a 10-year, $1000 face value zero-coupon bond with a YTM of 8%.
- It is customary to value zero-coupon bonds using semiannual discount rates and the semiannual rate is ½ the YTM.
- $Bond\ value = \frac{1000}{(1+\frac{8\%}{2})^{10\times 2}} = \frac{1000}{1.04^{20}} = \$456.39$
- The difference between the current price and its par value is the amount of compound interest rate that will be earned over the 10-year life.

Overview of Bond Sectors and Instruments



Alternative

1. Mutual Funds

A. Open-end fund

- What is fund?
- Open-end fund: ready to redeem shares at the closing value on any trading day.
- Creation and redemption for open-end funds
- NAV (net asset value) = investment company's assets - liabilities
- The share price of an open-end fund will always equal its NAV.

Fee structures and investment horizon

	Class A Fund	Class B Fund	Class C Fund
Front-end load (charged at time of purchase)	4% of Investment	None	None
Back-end load (redemption fees)	None	Initially 5% of sale proceeds – declines by 1% each year	2% during the first year
Annual fees (calculated on year-end values)			
Distribution fees		0.5%	1.0%
Fund management fees	0.8%	0.8%	0.8%
Other fund expenses	0.2%	0.2%	0.2%
Total annual fees	1.0%	1.5%	2.0%

B. Closed-end fund

- Buy and sell: a closed-end fund cannot be redeemed but can be traded like shares of stock in secondary market.
- Closed-end funds initially issue shares at a premium to the value of the fund's underlying assets, as compensation for issuance costs.
- The share of a closed-end fund may trade at a premium or at a discount to the actual NAV of the fund's assets.

C. ETF: exchange traded fund

- Mimic the performance of a specified index.
- Shares are traded in the secondary market like a closed-end fund.
- "In-kind" creation and redemption process

C. ETF: exchange traded fund

- Advantages of ETFs:
  1. Diversification over a broad index
  2. ETF trades throughout the day
  3. ETF investors know the composition of the fund
  4. Low management fees
  5. In-kind creation and redemption eliminates any trading at a discount or premium to NAV
  6. Decreased capital gain tax
- Disadvantage: tracking error: the portfolio is not identical to the benchmark index

2. Real Estate

NOI: net operating income

- Eg. An investor is considering the purchase of a small office building and must calculate the NOI.

Gross potential rental income	$250,000
Est. vacancy rate	5%
Insurance	$10,000
Taxes	$8,000
Utilities	$7,000
Maintenance	$15,000

- NOI=250,000– (250,000×5%) –10,000–8,000–7,000–15,000 = $197,000

Real estate valuation

- Assume the current market cap rate of 10%, we can compute the value of the property:

$$\text{AppraisalPrice} = \frac{\text{NOI}}{\text{market cap rate}}$$

- $197,500 / 10% = $1,975,000

3. Hedge Funds

Characteristics

- Objective: strive for absolute returns in all market scenarios.
- Form: limited partnership, offshore corporation
- Restrictions: the number of investors is limited, the amount of their investment is large, the prohibition of advertising, but exempt from SEC regulations
- Compensation for manager: base fee regardless of performance + incentive fee only if performance exceeds a target return

Classifications

- Long/short funds: they take long/short common stock position, use leverage, and global investing.
- Market neutral funds: hedge against general market moves, the positions will offset each other so that obtain a zero exposure to market.
- Global macro funds: make bets on the direction of market, currency, interest rate…
- Event-driven funds: invest in a distressed company, or in a potential takeover situation.

Hedge fund's advantages

- Higher returns
- Lower standard deviations
- Higher Sharpe ratio than traditional equity investments
- Low correlation with conventional investments

Disadvantages

- Cherry picking: managers only disclose successful records
- Incomplete historical data: only managers with good record are willing to be included in an index
- Survival of the fittest: an index excludes those that have failed
- Smoothed pricing: many assets in HF are not actively traded, so their values are estimates
- Asymmetrical returns: traditional risk measures do not account for HF's asymmetric return profile
- Fee structures and incentives: may cause fund manager to take big risks

Survivorship bias

- Databases of HF that contain only surviving HF will provide performance statistics that are biased upward (poor performing funds tend to cease to exist), and risk measures that are biased downward (funds that employ riskier strategies are likely to cease to exist).

4. Fund of Funds

Fund of funds

- Enable investors with limited capital to invest in a portfolio of hedge funds
- Grant new investors access to hedge funds that might be closed to them due to limitation on the number of investors
- Charge a management fee as well as those fees already charged by the hedge fund manager

Thank you!