

- Introduction to alternative investment

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### Traditional and Alternative

- Traditional
  - Cash, bond, stock
- Alternative
  - Derivative 衍生品
  - Leverage 杠杆
  - illiquid asset 流动差
  - short securities 可以卖空
  - Fee structure 费用高
    - Different, higher management fee
    - Additional incentive fee based on performance
  - **Low correlation**
    - **Low** returns **correlation** with traditional investment 低相关性
  - More specialization 更加专业化
  - Less regulation 监管少
  - less transparency 不透明
  - More problematic 更多问题
  - less historical data/volatility 数据不足
  - Different legal issues and tax treatments 不同的税收和法律问题

### Categories

- Hedge
  - leverage, long and short, derivative, illiquid
- Private equity
  - leveraged **buyout**, **venture capital** fund
- real estate
  - **residential or commercial** properties as well as real estate backed debt
- some ETF
- commodities
  - physical commodities, derivative, equity
  - commodity indices
- infrastructure
  - long-lived assets that provide public service
  - **economic** infrastructure: roads, airports, utility grids
  - **social** infrastructure: schools and hospitals
- other
  - tangible collectible assets
  - intangible: patents

### Benefits and Drawbacks

- **low** correlation over long periods

- risk measure
  - not std, worst month or frequency of **downside** return
- historical return 偏高
  - **higher** on average
    - less **efficiently** priced
    - extra for being **illiquid**
    - use **leverage**
- survivorship 高估
  - upward bias of return
- backfill bias 高估
  - upward bias of return
  - include previous performance data when it is added

### Hedge funds

- Prime brokers
- Absolute or relative return
- Less regulated
- **Limited** partnerships
- Fee structure
  - Management fee + incentive
- Less illiquid - redemption
  - Lockup period
    - Time no withdraw are allowed
  - Notice period
    - 30 or 90 days
    - The time take from request to fulfil the request
  - Additional fees are charged
    - Offset transaction cost
- Funds of funds
  - Diversification among hedge strategies
  - Smaller investors to invest
  - Additional fee
    - layers of fees beyond the fees charged by individual hedge fund

### Hedge fund Strategies

- **Event driven** 事件驱动
  - Merge arbitrage
    - Buy the firm being acquired
    - Sell the firm making the acquisition
  - Distressed/restructuring
    - Short **overvalued** security
  - Activist shareholder 积极分子
    - Buy more shares to influence the company
  - Special situation
    - Spinning off divisions, selling assets, distributing capital
- **Relative** value 相对价值

- Long and short relevant securities when price discrepancy
- Convertible arbitrage fixed income
  - Convertible bonds and common stocks
- Asset-based fixed income
  - Pricing discrepancies between MBS and ABS
- General fixed income
  - Pricing discrepancies
- Volatility
  - Different between implied and expected volatility option price
- Multi-strategy
  - Across asset classes and markets
- **Macro** strategies 宏观
  - Global economic trends
- **Equity** hedge fund strategies 股票
  - Long and short in public equity and derivative
  - Market neutral
  - Fundamental growth
    - High-growth company
  - Fundamental value
    - Undervalued
  - Quantitative directional
    - Long undervalue, short overvalued
  - Short bias
    - Short overvalued

### Hedge fund benefits and risks

- Better than equity in **down** market 比 equity 好（因为可以卖空）
- **Lag** behind equity in up market
- Less **correlation** with equity may offer diversification
- But correlation increase in financial crisis

### Hege fund due diligence

- Hard to quantify: reputation, risk mgt system, style
- Lack of persistence in return
- Previous strategy become less profitable

### Private Equity

- Private companies
- Public company takes private
- Early stage: venture capital
- Distressed investment
- Development capital funds

### Leveraged buyout (LBO)

- Borrow **debt** to purchased equity
- Debt

- Bank debt (leveraged debt)
- High-yield bond
- Mezzanine financing
  - Debt or preferred shares that are subordinated to high-yield bond
  - Warrants or conversion features -> participation in equity value increases
- **MBO (management buy-out)**
  - Existing management is involved in the purchase
- **MBI (management buy-in)**
  - External management team -> replace existing
- Attractive Features
  - High **cash flow** 高现金流
  - **Undervalued company/stock prices** 低估的价值
  - Willing management
  - **Inefficient** companies 运营不好
  - Low **leverage** 杠杆低
  - Secured debt is cheaper than unsecured debt

### Venture capital (VC)

- Most is
  - Equity
  - Convertible preferred shares
  - Convertible debt
- Risky but return is high
- Portfolio company: invested company
- **Closely** involved in development 参与公司运作
  - sitting on board or key management roles
- stages
  - formative stage
    - angel investing 天使-想法
      - **idea** stage
      - business plan or assess market potential
      - funding: individual
    - seed stage 研发
      - **product** development, marketing, research
      - ordinary or convertible **preferred** shares
    - early stage 商业化
      - initial **commercial** production and sales
  - later stage – 扩张
    - **expansion** of production
    - expand marketing campaign
  - mezzanine-stage financing – 上市
    - prepare the firm for an **IPO**
- **other**
  - development capital/minority equity

- for business growth or restricting
  - PIPE for public firms
- Distressed investing
  - Have financial difficulty
  - Take an **active** role and turn it around
  - Vulture investor
- Structure and fees
  - Limited partnership
  - **Committed capital**
    - Not all invested, draw down over three or five years
  - Management fee
    - 1%-3% of **committed** capital
  - Incentive fee
    - 20% profits
  - Clawback
    - Manager return any **incentive** fee to investor when profit less than 80%
- Exit strategies
  - Average holding five years
  - Trade sale
    - Sell to competitor or strategic buyer
  - IPO
  - Recapitalization
    - Issue debt to fund a dividend distribution to equity holder
  - Secondary sale 二手买卖
    - Sell to another private equity firm
  - Write-off/liquidation
    - Reassess and adjust to take losses from unsuccessful outcome
- Benefits and risks
  - Less than perfect correlation
  - Higher **return** than equity index
  - Std **higher** than equity
  - Suffer from survivorship and backfill bias
  - Revalued less infrequently
    - **Reported** std and correlation may be biased **downward**
- **DD**
  - Manager is important
  - **Operating and financial** experience

### Real Estate - Inflation protection

- Highly **correlated** with equity but less with bond
- Residential
  - Leveraged investment
    - Buyer buy take mortgage
    - Equity = property value – outstanding loan
  - Lender/issue -> direct investment -> sell MBS -> indirect investment
- Commercial – rental income

- Generate rents
- Home purchased for **rental income** belong this
- Long time, illiquidity, large size, complexity
- Limited partnership or REIT
- REIT
  - Issue shares that trade **publicly** like shares of stock
  - Income is used to pay **dividend**, 90% income must be distributed
- Timberland: timber or agricultural products
- Farmland: land price
- Benefits and risks
  - Appraisal index – property value 价值
    - Use estimated value (appraisals)
    - Return are smoother, lowest std, **understate** volatility
    - Rely on cash flow analysis and comparable sales
  - Repeat sales index - change in price 价格变化
    - price change for properties sold **multiple** times
    - **sample selection** bias
  - REIT indices – public traded price
    - Actual trading price of shares
    - Strong 0.6 correlation with equity
    - More frequently traded, more reliable
- DD
  - Local market, interest rate level
  - Specific: manager, regulation
  - Distressed property
  - Real estate development

### Commodities – inflation protection 通货膨胀保护

- Return based on **price change**
- Often use **derivative**
- Futures, forwards, options, swaps
- ETF (commodity ETD)
- Equities liked to commodities
  - Not perfectly correlated
- Managed futures fund
  - Limited similar to hedge fund
  - Mutual fund
- Individual managed account
  - Not Pooled fund, but specific investor
- Specialized fund in specific commodity sector
- Benefits and risk
  - Low Sharpe ratio, low return and high volatility
  - Move with **inflation** -> hedge

### Infrastructure

- Economic: roads, airports

- social: schools and hospitals
- **Brownfield** investment
  - **Already constructed**
  - More cash flow, high yield, little growth
- **Greenfield** investment
  - **To be constructed**
  - More uncertainty, low yields, but high growth
- Other
- Storage
- Specialized knowledge

### Hedge fund fee

- Management fee 2%
  - Can be based on start or **end** value
- Incentive fee
  - **excessive** of mgt fee or independent of mgt fee
  - Based on profit – management fee – hurdle fee
  - High water mark: high value reported
- High water mark
  - Above the highest value after fees previously records
  - Prevent: **Duplicate** charge for the same return
  - Clients are not charged an incentive fee if the latest cumulative return does not exceed the prior high-water mark
- Hurdle rate
  - Hard 无论如何都需要扣除
    - Excess of benchmark
    - based on **start** value 期初值
    - 如果仅对超出门槛收益率的超额部分按约定的比例计提业绩提成，则为 hard hurdle rate。
  - Soft 达到预值就不用
    - On all profit (if fail to pass, incentive is zero; otherwise, do not include it)
    - If hurdle rate > gross rate -> no incentive
    - 如果对全部的盈利分配业绩提成，则为 soft hurdle rate。
  - 不考虑管理费，期初 100W；第一年后管理资产的价值为 110W（收益 10%）；如果是 soft hurdle rate=8%，就先作比较，10%大于 8%，OK，可以提激励费了，对 110-100，这部分收取激励费。如果是 hard hurdle rate=8%（收益超过 8%的部分才提），只针对 110-108（110-100-100\*8%）这部分提激励费。
- Funds of funds
  - Additional 1 and 10
- Variation
  - **Mgt** fee: beging or end period
  - **Incentive**: net of mgt fee or **independent** mgt fee
- **Process**

- **Calculate management fee** 管理费 - 期初还是期末的值
  - based on **end value** or start value
- **calculate profit** 盈利 - 初始还是高水位值
  - $\text{profit} = \text{end value} - \text{start value}$  or
  - $\text{profit} = \text{end value} - \text{high water mark}$
- **gross return** 毛利润
  - $\text{profit} / \text{start value}$
- calculate hurdle fee
  - hard hurdle rate (must be **deducted**) 期初值
    - $\text{hurdle fee} = \text{start value} * \text{hurdle rate}$
  - soft hurdle rate is given 要么不起作用, 要么全部起作用
    - if soft rate  $\leq$  gross rate, hurdle fee = 0
    - if soft rate  $>$  gross rate, hurdle fee = profit 无奖励费
- calculate incentive fee 奖励费 – 独立还是净值
  - if **gross return**  $<$  soft hurdle rate, incentive is **zero**
  - net of management fee
    - $(\text{profit} - \text{management fee} - \text{hard hurdle fee}) * \text{incentive rate}$
  - Independent
    - $(\text{profit} - \text{hard hurdle fee}) * \text{incentive rate}$
- Total fee
  - Management fee + incentive fee

## Valuation

- Hedge fund
  - Traded securities -> market value
    - Can be Closed: bid for long, ask for short
    - Use the average price
    - Trading NAV: adjust for illiquidity
  - Non-traded securities -> model/estimated value
- PE valuation
  - Market/comparable: EBITDA
  - Discounted cash flow: dividend, free cash flow
  - Asset-based
    - Market or liquidation value
- Real estate
  - Comparable sales – sell 销售
    - Recent **sales** of similar properties
  - Income – use 使用
    - PV of **expected** future cash flow
    - net operation income (NOI) / a capitalization (cap) rate
  - Cost - replace 替换
    - **Replacement** cost of a property
- REIT valuation
  - Income based
    - funds from operations (FFO)/cap rate
      - net income + depreciation – gains + losses



- adjusted funds from operation (AFFO) / cap rate
    - similar to free cash flow, minute recurring capital
  - asset based
    - NAV = market value of asset – market value of liabilities
- commodity valuation
  - future price = spot \* (1+risk-free)+cost-convenience
  - contango: future > spot
  - backwardation: future < spot
  - three sources of return
    - roll yield (**spot – contract price**)
      - difference between spot and futures prices
      - positive for backwardation
      - **negative** for contango
    - collateral yield
      - interest earned on the collateral
    - change in spot prices
      - total price return is
        - change in spot prices
        - convergence of future price to spot price
- Risk management
  - Std may be misleading
    - Not normal, fat tail/leptokurtic, negatively skewed
    - Use appraisal or models to estimate values,
      - Returns are smoothed
      - Std and correlation understated
    - Publicly traded REIT and ETF
  - Use VaR
  - Sortino ratio: downside deviation
  - Management underperformance
  - Less transparent
  - Illiquid
- Due Diligence
  - Organization
  - Portfolio management
  - Operations and controls
  - Risk management
  - Legal review
  - Fund terms

## Summary

- Hedge fund
  - partnership
  - Fee: asset under management
  - Receive fee before investor
- Private equity
  - Comparable, asset, cash flow
  - partnership

- Fee: **committed capital**
  - Receive fee after investor
- Commodity
  - Derivative, inflation protection
- Real estate
  - Comparable sales, income, cost
- Infrastructure
  - Long time, large amount