Hedge funds

1. Common strategies :
- Convertible arbitrage :
  + Exploit mispricings in price of convertible securities (convertible bonds, convertible preferred stocks, warrants)
  + Long undervalued convertible securities + short stock
  + Increase stock volatility → Increase embedded option value → increase convertible securities value
- Distressed securities :
  + Distressed securities are undervalued → offer superior return
  + Illiquid → Long-only
- Emerging markets : Long-only, no derivatives to hedge
- Equity market neutral : Long undervalued securities + Short overvalued securities (pairs trading) → eliminate systematic risk + gain on mispricing
- Hedge equity strategies : Long undervalued securities + Short overvalued securities (pairs trading) → gain on mispricing, but not eliminate systematic risk
- Fixed income arbitrage : Long / short psoition in fixed income based on expected changes in yield curve / credit spread
- Global macro strategies : take position in major financial / nonfinancial markets. Focus on entire group / area on investment
- Merger arbitrage : earn return from merger, spin-offs, takeover
- Fund of funds : consist several funds (10-30)
  + Diversify among hedge fund manager / style
  + Total fee = fee to manager of FOF + fee to manager of each fund
  + Cash drag issue : reserve extra cash to meet potential withdrawals of investors
  + Style drift issue : individual hedge fund may change its investment strategy

2. Structure :
- Compensation structure :
  + Asset under management fee (1%-2%)
  + Incentive fee (20%) : encourage manager to earn higher profit
  + High water marks : avoid doublr incentive fee
- Lock-up period : limit withdrawals by require minimum investment period + designated exit time

3. Performance evaluation issues :
- Absolute-return vehicles : fund target absolute periodic return. No benchmark exists
- Considerations on performance of hedge fund :
  + Lock-up period : longer lock-up period → higher returns
  + Younger fund → higher returns
  + Smaller fund → higher returns
- Returns : smoothen by using rolling returns (e.g.: 12 month average return)
- Deleverage : investments are treated as it were fully paid for
- Risk : hedge fund returns are usually skewed, with fat tails → standard deviation fails to measure true risk
- Downside deviation : too focus on negative returns + not penalise for high positive returns → increase standard deviation

4. Sharpe ratio issues :

$$Sharpe\ ratio = \frac{Annualised\ return\ - Annualised\ risk\ free\ rate}{Annualised\ standard\ deviation}$$

- Time dependency : Annual Sharpe ratio is estimated using shorter time period. If estimate Sharpe ratio using quarterly returns:
  + Quarterly returns x 4
  + Quarterly standard deviation x √4
  → upward bias Sharpe ratio
- Assume normality : assume normal distribution → inappropriate
- Assume liquidity : infrequent / missing / assumed return observations → upward biased Sharpe ratio
- Assume uncorrelated returns : correlated returns → artificially lower standard deviation
- Stand-alone measure : do not consider diversification effect

5. Benchmark :
- Composing methods :
  + Selection criteria : vary, in term of assets under management, length of track record, restrictions on new investments
  + Style classification : vary, as how to classify a fund by style
  + Weighting scheme : equally weighted / basewd upon assets under management
  + Rebalancing rules : must be defined, frequency can vary (monthly to annually)
- Index providers:
  + CISDM : cover both hedge funds and managed futures
  + Credit Suisse : multiple benchmark for different strategies; weighting based upon assets under management
  + EACM Advisers : equally weighted 100 funds in many categories
  + Hedge fund intelligence : equally hedge fund invested in Europe and Asia
  + Hedgefund.net : equally weighted index cover > 40 strategies
  + HFR : equally/assets weighted index + equally weighted sub-indexes based on managers' reporting of hedge fund returns
  + Morningstar MSCI : index classified to 5 basic categories, each category are separate based on region and asset class
- Hedge fund issues :
  + Relevance of past data
  + Popularity bias : inflow of investment to a fund will mislead the index
  + Survivorship bias : index may drop funds with poor track records / failed funds
  + Stale price bias : appraisal / infrequent pricing → understate volatility
  + Backfill / inclusion bias : filling missing past data → bias index