Alternative Investments for Portfolio Management

CFA三级培训项目

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Topic in CFA Level III

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Framework

Alternative Investments

- **SS9: Alternative Investments for Portfolio Management**
  - R19 Hedge Fund Strategies
  - R20 Asset Allocation to Alternative Investments

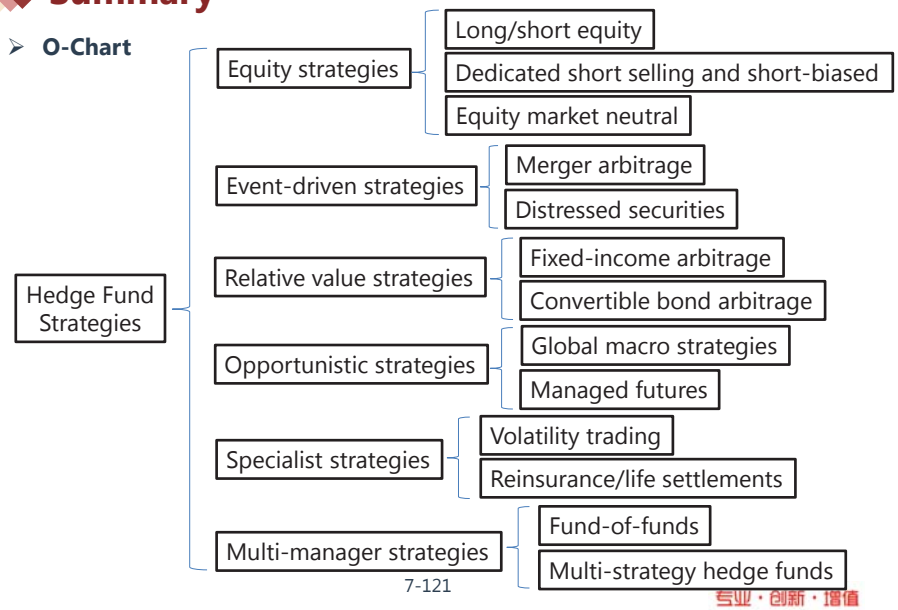
Hedge Fund Strategies

Overview of Hedge Fund Strategies

- **Key features of hedge funds**
  - Lower regulatory and legal constraints (Lack of transparency).
  - Flexible mandates: Flexibility to use short selling and derivatives.
    - ✓ A larger investment universe.
    - ✓ Aggressive investment exposures.
    - ✓ Comparatively free use of leverage.
  - Liquidity constraints for investors.
  - Higher cost structures.
- **Types of hedge fund**
  - **Single-manager fund**
    - ✓ One portfolio manager invests in one strategy or style.
  - **Multi-manager fund**
    - ✓ **Multi-strategy fund**, in which teams of portfolio managers trade and invest in multiple different strategies within the same fund.
    - ✓ **FOFs**

Summary

- **O-Chart**



1. Equity Strategies

- **Equity hedge fund strategies**
  - Invest primarily in equity and equity-related instruments.
  - Alpha related to equity strategies tends to derive from the wide variety of equity investments available globally combined with astute long and short stock picking.
- **Equity-related hedge fund strategies**
  - The size and sign of equity market exposure often dictate the classification of equity hedge fund strategies.
  - Types of equity hedge fund strategies
    - ✓ Long/short equity;
    - ✓ Dedicated short bias;
    - ✓ Equity market neutral.
- **The main risk: equity-oriented risk.**

1.1 Long/short equity

- **Strategy Implementation**
  - Fund managers will identify overpriced and underpriced stocks
    - ✓ Purchases (long positions) stocks that will rise in value;
    - ✓ Sells (short positions) stocks that will fall in value.
  - The market exposure is the net of the beta-adjusted long and short exposures.
  - **Sector-specific focus (specialist L/S fund managers)**
    - ✓ Search for single-name shorts for portfolio alpha and added absolute return.
  - **Generalist L/S managers**
    - ✓ Use index-based short hedges to reduce market risk.
    - ✓ They may also use index funds to achieve a desired exposure.
  - Overall, long/short equity investing in most instances is a mix of extracting alpha on the long and short sides from single-name stock selection combined with some naturally net long embedded beta.

1.1 Long/Short Equity

- **Characteristic**
  - Varies strategies. Typically have average exposures of 40%–60% net long.
  - Return profiles are typically aimed **to achieve average annual returns** roughly equivalent to a long-only approach but with a standard deviation 50% lower than a long-only approach.
  - This strategy can typically be handled by both limited partner and mutual fund-type vehicles.
  - Leverage Usage:
    - ✓ Variable: The more market-neutral or quantitative the strategy approach, the more levered the strategy application tends to be to achieve a meaningful return profile.
- **Role in portfolio**
  - Liquid, diverse, with mark-to-market pricing driven by public market quotes;
  - Added short-side exposure typically reduces beta risk and provides an additional source of potential alpha and reduced portfolio volatility.

1.2 Dedicated Short Selling and Short-Biased

- These managers look for poorly managed companies, firms in declining market segments, or even firms with deceitful accounting.
  - **Dedicated short-selling funds** seek out securities that are overpriced in order to sell them short.
  - **Short-biased** managers use a similar strategy, except that the short position is somewhat offset by a long exposure.
  - **Activist short selling,** in which the fund manager not only takes a short position in a stock, but also presents research that contends that the stock is overpriced.
- One major challenge of being a short seller is that markets inevitably rise over time, which creates a tendency toward negative returns for shorts.

1.2 Dedicated Short Selling and Short-Biased

- **Strategy Implementation**
  - Short-selling managers typically take a bottom-up approach by scanning the universe of potential sell targets to uncover and sell short.
    - ✓ Methods: Altman Z-score & Beneish M-score.
  - However, although some stocks tend to be attractive targets, the stock's high short-interest ratio and high cost to borrow ("on special") are very concerning. Both factors suggest significant potential that a dangerous short-squeeze situation.

1.2 Dedicated Short Selling and Short-Biased

- **Characteristics**
  - Lower return but with a negative correlation benefit.
  - More volatile than a typical L/S equity hedge fund given short beta exposure.
  - Managers have some ability to add alpha via market timing of portfolio beta tilt, but it is difficult to do with consistency or added alpha.
  - This strategy is typically handled best in a limited partnership because of difficult operational aspects of short selling.
  - Leverage Usage
    - ✓ Low: There is typically sufficient natural volatility that short-selling managers do not need to add much leverage.
- **Role of portfolio**
  - Liquid, negatively correlated alpha to that of most other strategies, with mark-to-market pricing from public prices.
  - But historic returns generally disappointing.

1.3 Equity Market Neutral

- **Equity market-neutral (EMN)**
  - Equity market-neutral (EMN) hedge fund strategies take opposite (i.e., long and short) positions in similar or related equities that have divergent valuations.
  - The overall goal of EMN funds is to create a portfolio that not only generates alpha, but is also relatively immune to movements in the overall market.
- **Types of EMN**
  - **Pairs trading.** Two stocks with similar characteristics are identified that are respectively overvalued and undervalued.
  - **Stub trading.** This EMN strategy involves going long and short shares of a subsidiary and its parent company.
  - **Multi-class trading.** This strategy entails going long and short relatively mispriced share classes of the same firm.

Example: Pairs trading

- Ling Chang, a Hong Kong-based EMN manager, has been monitoring PepsiCo Inc. (PEP) and Coca-Cola Co. (KO), two global beverage industry giants. After examining the Asia marketing strategy for a new PEP drink, Chang feels the marketing campaign is too controversial and the overall market is too narrow. Although PEP has relatively weak earnings prospects compared to KO, 3-month valuation metrics show PEP shares are substantially overvalued versus KO shares (relative valuations have moved beyond their historical ranges). As part of a larger portfolio, Chang wants to allocate $1 million to the PEP versus KO trade and notes the historical betas and S&P 500 Index weights, as shown in the following table.

Stock	Beta	S&P 500 Index Weight
PEP	0.65	0.663
KO	0.55	0.718

- Discuss how Chang might implement an EMN pairs trading strategy.

Example

- **Solution:**
  - Chang should take a short position in PEP and a long position in KO with equal beta-weighted exposures.
  - Given Chang wants to allocate $1 million to the trade, she would take on a long KO position of $1 million. Assuming realized betas will be similar to historical betas, to achieve an equal beta-weighted exposure for the short PEP position, Chang needs to short $846,154 worth of PEP shares [= –$1,000,000 / (0.65/0.55)].
  - Only the overall difference in performance between PEP and KO shares would affect the performance of the strategy because it will be insulated from the effect of market fluctuations. If over the next 3 months the valuations of PEP and KO revert to within normal ranges, then this pairs trading EMN strategy should reap profits.

1.3 Equity Market Neutral

- **Strategy implementation**
  - First, the investment universe is evaluated to include only tradable securities with sufficient liquidity and adequate short-selling potential.
  - Second, securities are analyzed for buy and sell opportunities using fundamental models (which use company, industry, and economic data as inputs for valuation) and/or statistical and momentum-based models.
  - Third, a portfolio is constructed with constraints to maintain market risk neutrality, and there is often dollar (i.e., money), sector, or other factor risk neutrality.
  - Fourth, the availability and cost of leverage are considered in terms of desired return profile and acceptable potential portfolio drawdown risk.

1.3 Equity Market Neutral

- **Characteristics**
  - They have relatively modest return profiles, with portfolios aimed to be market neutral, and differing constraints to other factors and sector exposures are allowed.
  - They generally have high levels of diversification and liquidity and lower standard deviation.
  - Shorter horizons and more active trading.
  - High leverage
  - EMN strategies typically do not meet regulatory leverage limits for mutual fund vehicles. So, limited partnerships are the preferred vehicle.
- **Role in portfolio**
  - EMN strategies are especially attractive during periods of market vulnerability and weakness, since their sources of return and alpha do not require accepting beta risk.

Example

- Considering various equity-related hedge fund strategies, a strategy that is most likely to apply relatively high levels of leverage is:
  A. an EMN strategy.
  B. a dedicated short strategy.
  C. a short-biased strategy.

Solution: A

EMN strategies usually apply somewhat high levels of leverage in order to produce meaningful levels of return. Neither dedicated short strategies nor short-biased strategies typically make significant use of leverage.

Example

- Relative to other hedge fund strategies, EMN strategies are most likely to:
  A. exhibit relatively modest returns.
  B. be vulnerable to periods of market weakness.
  C. earn return from alpha and beta risk.

Solution: A

Compared to various other hedge fund strategies, EMN strategies generally have relatively modest return profiles. EMN funds' primary source of return is alpha. They do not take on beta risk. Their lack of market exposure make EMN strategies attractive in periods of market weakness.

2. Event-Driven Strategies

- **Event-driven hedge fund strategies** are those that attempt to profit from predicting the outcome of corporate events.
- **Types of event-driven approach**
  - **Soft-catalyst event-driven approach**
    - ✓ Investments can be made proactively in anticipation of an event that has yet to occur
  - **Hard-catalyst event-driven approach**
    - ✓ investments can be made in reaction to an already announced corporate event in which security prices related to the event have yet to fully converge
  - The hard approach is generally **less volatile** and **less risky** than soft-catalyst investing.
- **The main risk: event risk**.
- **Event-driven strategies**
  - Merger Arbitrage;
  - Distressed Securities.

2.1 Merger Arbitrage

- **Strategy implementation**
  - **Types of acquisition**
    - ✓ **Cash-for-stock:** may choose to use leverage to buy the target firm
      - ◆Acquiring company (A) offers the target company (T) a cash price per share to acquire T.
      - ◆The manager buys the target company (T).
    - ✓ **Stock-for-stock acquisition**
      - ◆A offers a specific number of its shares in exchange for 1 T share.
      - ◆The manager buys T and sells the acquiring company (A) in the same ratio as the offer.
      - ◆Short selling the acquiring firm may be difficult due to liquidity issues or short-selling constraints, especially in emerging markets.

2.1 Merger Arbitrage

- **Characteristics**
  - Relatively liquid strategy.
  - If the deals fail, this strategy has market sensitivity and left-tail risk attributes.
  - Its return profile is insurance-like plus a short put option.
  - The preferred vehicle is limited partnership because of merger arbitrage's use of significant leverage, but some low-leverage, low-volatility liquid alts merger arbitrage funds do exist.
  - Leverage Usage:
    - ✓ High: typically apply 3 to 5 times leverage in order to achieve low-double-digit returns.
- **Role in portfolio**
  - Relatively high Sharpe ratios with typically low double-digit returns and mid–single digit standard deviation (depending on specific levels of leverage applied), but left-tail risk is associated with an otherwise steady return profile.

Example

- An acquiring firm (A) is trading at $45/share and has offered to buy target firm (T) in a stock-for-stock deal. The offer ratio is 1 share of A in exchange for 2 shares of T. Target firm T was trading at $15 per share just prior to the announcement of the offer. Shortly thereafter, T's share price jumps up to $19 while A's share price falls to $42 in anticipation of the merger receiving required approvals and the deal closing successfully. A hedge fund manager is confident this deal will be completed, so he buys 20,000 shares of T and sells short 10,000 shares of A.
- What are the payoffs of the merger arbitrage strategy if the deal is successfully completed or if the merger fails?

Example

- **Solution:**
  - At current prices it costs $380,000 to buy 20,000 shares of T, and $420,000 would be received for short selling 10,000 shares of A. This provides a net spread of $40,000 to the hedge fund manager if the merger is successfully completed. If the merger fails, then prices should revert to their pre-merger announcement levels.
  - The manager would need to buy back 10,000 shares of A at $45 (costing $450,000) to close the short position, while the long position in 20,000 shares of T would fall to $15 per share (value at $300,000). This would cause a total loss of $110,000 [= (A: +$420,000 – $450,000) + (T: –$380,000 + $300,000)].
  - In sum, this merger strategy is equivalent to holding a riskless bond with a face value of $40,000 (the payoff for a successful deal) and a short binary put option, which expires worthless if the merger succeeds but pays out $110,000 if the merger fails.

2.2 Distressed Securities

- Distressed securities strategies focus on firms that either are in bankruptcy, facing potential bankruptcy, or under financial stress.
  - Firms face these circumstances for a wide variety of reasons: warning competitiveness, excessive leverage, poor governance, accounting irregularities, outright fraud.
- **Outcomes of bankruptcy process**
  - **In liquidation,** the firm's assets are sold off and securities holders are paid sequentially based on priority of their claims
    - ✓ Senior secured debt (high),
    - ✓ Junior secured debt,
    - ✓ Unsecured debt,
    - ✓ Convertible debt,
    - ✓ Preferred stock,
    - ✓ Common stock (finally).
  - **In re-organization,** a firm's capital structure is re-organized and terms for current claims are negotiated and revised.

2.2 Distressed Securities

- **Strategy implementation**
  - In a liquidation situation
    - ✓ Focus on determining the **recovery value** for different classes of claimants.
    - ✓ Buy the **undervalued debt securities** in hopes of realizing the higher recovery rate.
  - In a reorganization situation
    - ✓ Focus on how the firm's finances will be **restructured**
    - ✓ Assessing the value of the business enterprise and the future value of different classes of claims.

2.2 Distressed Securities

- **Characteristics**
  - The **return profile** for distressed securities investing is typically at the **higher** end of event-driven strategies but with more variability.
  - Distressed securities investing is usually long-biased.
  - Distressed securities investing typically entails relatively **high levels of illiquidity**, especially if using a concentrated activist approach.
  - **Leverage:** generally uses moderate to low leverage, typically with 1.2 to 1.7 times NAV invested.
- **Role in portfolio**
  - Returns tend to be "lumpy" and somewhat cyclical. Distressed investing is particularly attractive in the early stages of an economic recovery after a period of market dislocation.

Example

- An investment in distressed securities is most likely to be characterized by:
  - A. a long bias.
  - B. a high level of liquidity.
  - C. a large amount of leverage.

- **Solution: A**
  - While short positions are possible in distressed securities investing, it is usually long biased. Illiquidity tends to be high, and the strategy generally uses moderate to low leverage.

Example

- In a sequential payoff during a liquidation, the security holder that is most likely to be paid off first is the holder of:
  - A. junior secured debt.
  - B. convertible debt.
  - C. preferred stock.

- **Solution: A**
  - When a firm's assets are sold off in liquidation, securities holders are paid sequentially depending on the priority of their claims: first senior secured debt, then junior secured debt, unsecured debt, convertible debt, preferred stock, and lastly common stock.

3. Relative Values Strategies

- **Relative value strategies**
  - Attempt to exploit valuation differences between securities.
  - Changes in credit quality, liquidity, and implied volatility (for securities with embedded options) are some of the causes of relative valuation differences.
  - Involve the significant use of leverage
- **Relative values strategies**
  - Fixed-Income Arbitrage;
  - Convertible Bond Arbitrage.

3.1 Fixed-Income Arbitrage

- Fixed-income arbitrage strategies attempt to **exploit pricing inefficiencies** by taking **long and short positions** across a range of debt securities, including sovereign and corporate bonds, bank loans, and consumer debt.
- **Arbitrage opportunities sources**
  - Duration
  - Credit quality
  - Liquidity
  - Optionality

3.1 Fixed-Income Arbitrage

- **Strategy implementation**
  - **Types of fixed-income arbitrage strategies**
    - ✓ **Yield curve trades**
      - ◆Involves taking long and short positions at different points on the yield curve
      - ◆Relative mispricing of securities offers the best opportunities, such as in a curve flattening or steepening, to profit.
    - ✓ **Carry trades**
      - ◆Involve going long a higher yielding security and shorting a lower yielding security
      - ◆Expects to receive the positive carry and profit on long and short sides of the trade when the temporary relative mispricing reverts to normal.
  - **The payoff profile** of this fixed-income arbitrage strategy resembles a short put option.
    - ✓ If the strategy unfolds as expected, it returns a **positive carry plus a profit from spread narrowing**.
    - ✓ If the spread unexpectedly widens, then **the payoff becomes negative.**

3.1 Fixed-Income Arbitrage

- **Characteristics**
  - The risk/return profile of fixed-income arbitrage trading derives from the high correlations found across different securities, the yield spread pick-up to be captured, and the sheer number of different types of debt securities across different markets with different credit quality and convexity aspects in their pricing.
  - Yield curve and carry trades within the US government universe tend to be very liquid but typically have the fewest mispricing opportunities.
  - This strategy has high leverage usage, but leverage availability typically diminishes with product complexity.
- **Role in portfolio**
  - A function of correlations between different securities, the yield spread available, and the high number and wide diversity of debt securities across different markets.

3.2 Convertible Bond Arbitrage

- **Convertible bonds = straight debt + long equity call option.**
  - Conversion value =current stock price * conversion ratio
    - ✓ Conversion ratio = number of shares for which the bond can be exchanged.
  - Current conversion value < convertible bond price, call is OTM, convertible bonds → a straight bond.
  - Current conversion value > convertible bond price, call is ITM, convertible bonds → a stock.

3.2 Convertible Bond Arbitrage

- **Strategy implementation**
  - Buy the relatively undervalued convertible bond;
  - Take a short position in the relatively overvalued underlying stock.
- **Several concerns**
  - **Short squeeze:** when short selling, shares must be located and borrowed; as a result, the stock owner may subsequently want his/her shares returned at a potentially inopportune time, such as during stock price run-ups.
  - Second, when credit spreads widen or narrow, there would be a **mismatch in the values of the stock and convertible bond position**s that the convertible manager may or may not have attempted to hedge away.
  - Third, the strategy can lose money because of **time decay of the convertible bond's embedded call option** during periods of reduced realized equity volatility.

3.2 Convertible Bond Arbitrage

- **Characteristics**
  - Convertible arbitrage managers strive to extract and benefit from this structurally cheap source of implied volatility by **delta hedging** and **gamma trading** short equity hedges against their long convertible holdings.
  - Liquidity issues surface for convertible arbitrage strategies in two ways:
    - ✓ 1) naturally **less-liquid securities** because of their relatively small issue sizes and inherent complexities;
    - ✓ 2) availability and **cost** to borrow underlying equity for **short selling**.
  - Because of many legs needed to implement convertible arbitrage trades, relatively **high levels of leverage** are used to extract a modest ultimate gain from delta hedging.
    - ✓ For example, short sale, CDS transaction, interest rate hedge.
- **Role in portfolio**
  - Convertible arbitrage works best during periods of high convertible issuance, moderate volatility, and reasonable market liquidity.

Example

- Cleopatra Partners is a Dubai-based hedge fund engaging in convertible bond arbitrage. Portfolio manager Shamsa Khan is considering a trade involving the euro-denominated convertible bonds and stock of QXR Corporation. She has assembled the following information:

QXR Convertible Bond		
Price (% of par)	120	—
Coupon (%)	5.0	—
Remaining maturity (years)	1.0	
Conversion ratio	50	—
S&P Rating	BBB	—

QXR Inc.		Industry Average
Price (per share)	30	--
P/E (x)	30	20
P/BV (x)	2.25	1.5
P/CF (x)	15	10

Example

- Additional Information:
  - It costs €2 to borrow each QXR share (paid to the stock lender) to carry the short position for a year.
  - The stock pays a €1 dividend.
- Discuss (using only the information in the table) the basic trade setup that Khan should implement.
- Demonstrate (without using the additional information) that potential profits earned are the same whether QXR's share price falls to €24, rises to €36, or remains flat at €30.
- Discuss (using also the additional information) how the results of the trade will change.

Example

- Solution to 1:
  - QXR's convertible bond price is €1,200 [= €1,000 × (120/100)], and its conversion ratio is 50; so, the conversion price is €24 (€1,200/50). This compares with QXR's current share price of €30. QXR's share valuation metrics are all 50% higher than its industry's averages. It can be concluded that in relative terms, QXR's shares are overvalued and its convertible bonds are undervalued. Thus, Khan should buy the convertibles and short sell the shares.

Example

- Solution to 2:
  - By implementing this trade and buying the bond at €1,200, exercising the bond's conversion option, and selling her shares at the current market price, Khan can lock in a profit of €6 per share under any of the scenarios mentioned, as shown in the following table:

	Profit on:		
QXR Share Price	Long Stock via Convertible Bond	Short Stock	Total Profit
24	0	6	6
36	12	–6	6
30	6	0	6

Example

- Solution to 3:
  - The €2 per share borrowing costs and the €1 dividend payable to the lender together represent a €3 per share outflow that Khan must pay. But, the convertible bond pays a 5% coupon or €50, which equates to an inflow of €1 per share equivalent (€50 coupon/50 shares per bond). Therefore, the total profit outcomes, as indicated in the table, would each be reduced by €2. In sum, Khan would realize a total profit of €4 per each QXR share.

4. Opportunistic Hedge Fund Strategies

- Opportunistic hedge fund strategies seek to profit from investment opportunities across a wide range of markets and securities using a variety of techniques.
  - They invest primarily in asset classes, sectors, regions, and across macro themes and multi-asset relationships on a global basis.
- **Categorization methods**
  - 1) The type of analysis and approach that drives the trading strategy (technical or fundamental).
  - 2) How trading decisions are implemented (discretionary or systematic)
  - 3) The types of instruments and/markets in which they trade.
- **Opportunistic hedge fund strategies**
  - Global macro strategies;
  - Managed futures.

4.1 Global Macro Strategies

- Global macro strategies focus on global relationships across a wide range of asset classes and investment instruments.
- **Strategy implementation**
  - Global macro strategies are typically **top-down** and employ a range of **macroeconomic and fundamental models** to express a view regarding the direction or relative value of an asset or asset class.
  - A mixture of positions
    - ✓ Individual securities,
    - ✓ Baskets of securities,
    - ✓ Index futures,
    - ✓ Foreign exchange futures/forwards,
    - ✓ Precious or base metals futures,
    - ✓ Agricultural futures,
    - ✓ Fixed-income products or futures,
    - ✓ Derivatives or options on any of these.

4.1 Global Macro Strategies

- **Characteristics**
  - Despite their **heterogeneity**, a common feature among most global macro managers is the **use of leverage**, often obtained through the use of derivatives, to magnify potential profits.
  - Generally, the key source of returns in global macro strategies revolves around correctly discerning and capitalizing on trends in global markets.
- **Role in portfolio**
  - Global macro can be very useful over a full market cycle in terms of portfolio diversification and alpha generation.

4.2 Managed Futures

- Take long and short positions in a variety of derivatives contracts including futures, forwards, options on futures, swaps, and sometimes currencies and commodities.
- **Futures development**
  - Gaining in size (i.e., open interest) and liquidity;
  - Trading sector and industry index futures as well as more exotic contracts. E.g.,futures on weather (e.g., temperature, rainfall) and derivatives contracts on carbon emissions.
- **Strategy implementation**
  - The most common type of managed futures approach is **time-series momentum (TSM) trend following**.
  - A second, less common approach is using **cross-sectional momentum (CSM) strategies.**

4.2 Managed Futures

- **Characteristics**
  - Both global macro and managed futures strategies are **highly liquid** but with some crowding aspects and execution slippage in managed futures as AUM have grown rapidly.
  - **Managed futures** managers tend to take a **more systematic approach**, while **global macro managers** are generally **more discretionary** in their application of models and tools.
  - **Managed futures and global macro managers** are somewhat cyclical and at the **more volatile** end of the spectrum of hedge fund strategies (with volatility positively related to the strategy's time horizon). In addition, macro managers can also be early and overly anticipatory in their positioning.
  - **High leverage** is embedded in futures contracts.
- **Role in portfolio**
  - Returns of managed futures strategies typically exhibit **positive right-tail skewness** in periods of market stress, which is very useful for portfolio diversification.

Example

- Considering global macro strategies and managed futures strategies, it would be most accurate to state that:
  A. managed futures strategies use more discretionary approaches.
  B. global macro strategies use more systematic approaches.
  C. both strategies tend to be highly liquid and use high leverage.

- **Solution: C**
  - Managed futures strategies usually are implemented via systematic approaches, while global macro strategies more often use discretionary approaches. Both strategies typically use high leverage and tend to be highly liquid.

Example

- During periods of market stress:
  A. managed futures and global macro both exhibit right-tail skewness.
  B. managed futures strategies exhibit left-tail skewness.
  C. global macro strategies exhibit left-tail skewness.

- **Solution: A**
  - Returns of managed futures and global macro strategies both typically exhibit right-tail (positive) skewness during times of market stress. Global macro strategies, however, generally deliver more heterogeneous outcomes.

5. Specialist Strategies

- **Specialist hedge fund strategies** require highly specialized skill sets for trading in niche markets.
- **The main risk :** the risks of such strategies are often unique to the particular niche securities being invested in.
- **Specialist Strategies**
  - Volatility trading;
  - Reinsurance/life settlements.

5.1 Volatility Trading

- The goal of **relative value volatility arbitrage** strategies
  - Source and buy cheap volatility and sell more expensive volatility while netting out the time decay aspects normally associated with options portfolios.
- **Type of relative value volatility trading**
  - Capturing the volatility spread between same underlying options in different geographical location - **time-zone arbitrage**
  - Involve idiosyncratic, macro-oriented risks - **cross-asset volatility trading**

5.1 Volatility Trading

- **Strategy implementation**
  - To extract an outright long volatility view, options are purchased and delta hedging of the gamma exposure is required.
  - A second, similar path might be to implement the volatility trading strategy using OTC options.
  - Migrating to the use of VIX Index futures (or options on VIX futures) can more explicitly express a pure volatility view without the need for constant delta hedging of an equity put or call for isolating the volatility exposure.
  - A fourth path for implementing a volatility trading strategy would be to purchase an OTC volatility swap or a variance swap from a creditworthy counterparty.

5.1 Volatility Trading

- **Risk Profile and Liquidity**
  - Long volatility positioning exhibits positive convexity
  - On the short side, option premium sellers generally extract steadier returns in normal market environments.
  - Liquidity varies across the different instruments used for implementation.
    - ✓ VIX Index futures and options are very liquid;
    - ✓ OTC contracts can be customized with longer maturities but are less liquid and less fungible between different counterparties.
- **Role in portfolio**
  - A useful source of portfolio return alpha across different geographies and asset classes.

5.2 Reinsurance/Life Settlements

- Hedge funds have also entered the world of insurance, reinsurance, life settlements, and catastrophe reinsurance.
- Insurance contracts are generally **not liquid** and are **difficult to sell** or purchase after contract initiation.
- **Types of insurance contracts sold by insurance providers**
  - Vehicle and home insurance,
  - Life insurance,
  - Catastrophe insurance, which covers damage from such events as floods, hurricanes, or earthquakes

5.2 Reinsurance/Life Settlements

- **Strategy implementation**
  - The hedge fund would look for the following policy characteristics:
    - ✓ The surrender value being offered to an insured individual is relatively low;
    - ✓ The ongoing premium payments to keep the policy active are also relatively low;
    - ✓ The probability is relatively high that the designated insured person is indeed likely to die within a certain period of time (i.E., Earlier than predicted by standard actuarial methods).
  - On finding the appropriate policy (or, more typically, a pool of policies), the hedge fund manager pays a lump sum (via a broker) to the policyholder(s), who transfers the right to the eventual policy benefit to the hedge fund.
  - Valuation methods for catastrophe insurance may require the hedge fund manager to consider global weather patterns and make forecasts using sophisticated prediction models that involve a wide range of geophysical inputs.

5.2 Reinsurance/Life Settlements

- **Characteristics**
  - Life insurance protects the policyholder's dependents in the case of his/her death.
    - ✓ The secondary market for life insurance involves the sale of a life insurance contract to a third party—a life settlement.
  - A hedge fund strategy focusing on life settlements involves analyzing pools of life insurance contracts being offered for sale, typically being sold by a third-party broker who purchased the insurance contracts from the original policyholders.
- **Role in portfolio**
  - A very appealing feature of insurance investments in a portfolio is that the risk inherent in these strategies is almost entirely uncorrelated with market risks and business cycles.
    - ✓ Hedge funds that invest in such assets can add alpha to a portfolio while simultaneously adding return diversification.

Example

- A hedge fund is most likely to purchase a pool of life insurance policies that has high:
  - A. surrender value.
  - B. ongoing premium payments.
  - C. likelihood of the insured person dying soon.

- **Solution: C**
  - In implementing life settlement strategies, a hedge fund manager looks for policies with the following traits: low surrender value being offered to the insured individual, low ongoing premium payments required of the investor, and high probability that the insured person will die sooner than predicted by actuarial methods.

6. Multi-Manager Strategies

- **Three main approaches** are used to combine individual hedge fund strategies into a portfolio:
  - Creating one's own mix of managers
    - ✓ Investing directly into individual hedge funds running different strategies.
  - **Fund-of-funds**
    - ✓ Involves investing in a single fund-of-funds manager who then **allocates across a set of individual hedge fund managers** running different strategies.
  - **Multi-strategy funds**
    - ✓ Investing in a **single fund** that **includes multiple internal management teams** running different strategies under the same roof.

6.1 Fund-of-Funds

- Fund-of-funds (FoF) managers aggregate investors' capital and allocate it to a portfolio of separate, individual hedge funds following different, less correlated strategies.
- **Strategy implementation**
  - First, FoF managers will become acquainted with different hedge fund managers via the use of various databases and introductions at prime broker-sponsored capital introduction events, where hedge fund managers present their perceived opportunity sets and qualifications to potential investors.
  - Next, with both quantitative and qualitative top-down and bottom-up approaches, the formal manager selection process is initiated.
  - Once an individual hedge fund is deemed a true candidate for investment, the fund's Offering Memorandum and Limited Partnership Agreement will be fully reviewed.
  - After a hedge fund is approved and the strategy is included in the FoF portfolio, then the process moves into the ongoing monitoring and review phases.

6.1 Fund-of-Funds

- **Characteristics**
  - FoFs are important hedge fund "access vehicles" **for smaller high-net-worth investors and smaller institutions**.
  - FoFs offer a potentially **more diversification, less extreme risk exposures, lower realized volatility, less single manager tail risk** than direct investing in individual hedge fund strategies
- **Role in portfolio**
  - **Provide diversification** across hedge fund strategies;
  - Make occasional tactical, sector-based reallocation decisions;
  - Engage in underlying manager selection and due diligence;
  - Perform ongoing portfolio management, risk assessment, and consolidated reporting.

Example

- Compared to a multi-strategy fund, a fund-of-funds is most likely to offer the investor a more:
  A. effective tactical asset allocation.
  B. attractive fee structure.
  C. diverse strategy mix.

- **Solution: C**
  - Funds-of-funds generally offer a more diverse strategy mix than do multi-strategy funds. Multi-strategy funds offer quicker tactical asset allocation and generally a better fee structure (for example, netting risk between strategies is often absorbed by the multi-strategy general partner).

6.2 Multi-Strategy Hedge Funds

- **Strategy implementation**
  - Multi-strategy hedge funds combine multiple hedge fund strategies under the same hedge fund structure.
- **Characteristics**
  - Multi-strategy funds have generally outperformed with more variance and occasional large losses often related to **their higher leverage**.
  - Multi-strategy funds offer potentially faster tactical asset allocation and improved fee structure (netting risk handled at strategy level) but with higher manager-specific operational risks.
  - Multi-strategy funds also often impose investor-level or fund-level gates on maximum redemptions allowed per quarter.
  - Multi-strategy funds are somewhat more **prone to left-tail blow-up risk in stress periods.**
  - Better strategy transparency and shorter tactical reaction time make multi-strategy funds overall more resilient.
- **Role in portfolio**
  - The multi-strategy manager can react faster to different real-time market impacts

Example

- Sushil Wallace is the chief investment officer of a large pension fund. Wallace wants to increase the pension fund's allocation to hedge funds and recently met with three hedge fund managers. These hedge funds focus on the following strategies:

  Hedge Fund A: Specialist—Follows relative value volatility arbitrage

  Hedge Fund B: Multi-Manager—Multi-strategy fund

  Hedge Fund C: Multi-Manager—Fund-of-funds

- After a significant amount of internal discussion, Wallace concludes that the pension fund should invest in either Hedge Fund B or C for the diversification benefits from the different strategies employed. However, after final due diligence is completed, Wallace recommends investing only in Hedge Fund B, noting its many advantages over Hedge Fund C.

Example

- Discuss two advantages of Hedge Fund B relative to Hedge Fund C with respect to investment characteristics.

a. Multi-strategy managers like Hedge Fund B can reallocate capital into different strategy areas more quickly and efficiently than would be possible by a fund-of-funds (FoF) manager like Hedge Fund C. The multi-strategy manager has full transparency and a better picture of the interactions of the different teams' portfolio risks than would ever be possible for FoF managers to achieve. Consequently, the multi-strategy manager can react faster to different real-time market impacts—for example, by rapidly increasing or decreasing leverage within different strategies depending upon the perceived riskiness of available opportunities.

Example

b. The fees paid by investors in a multi-strategy fund can be structured in a number of ways, some of which can be very attractive when compared to the FoFs' added fee layering and netting risk attributes. Conceptually, FoF investors always face netting risk, whereby they are responsible for paying performance fees due to winning underlying funds while suffering return drag from the performance of losing underlying funds. Even if the FoF's overall performance is flat or down, FoF investors must still pay incentive fees due to the managers of winning funds.

Conditional Factor Risk Model

- A linear factor model can provide insights into the intrinsic characteristics and risks in a hedge fund investment.
  - $(Return\ on\ HF_i)_t = \alpha_i + \beta_{i,1}(Factor\ 1)_t + \beta_{i,2}(Factor\ 2)_t + \cdots + \beta_{i,K}(Factor\ K)_t + D_t\beta_{i,1}(Factor\ 1)_t + D_t\beta_{i,2}(Factor\ 2)_t + \cdots + D_t\beta_{i,K}(Factor\ K)_t + (error)_{i,t}$
- **where:**
  - α_i=intercept for hedge fund i
  - $\beta_{i,K}$(Factor K)t=exposure during normal periods to risk factor K
  - D_t=dummy variable that equals zero during normal periods, and one during a financial crisis
  - $D_t\beta_{i,K}$(Factor K)$_t$=incremental exposure to risk factor K during financial crisis periods
  - (error)$_{i,t}$=random error with zero mean
- Any **returns not explained by the model's risk factors** would be attributed to 1) omitted risk factors, 2) alpha (i.e., hedge fund manager skill), or 3) randomness (error).

Conditional Factor Risk Model

- This left the **following four factors** for measuring risk exposures:
  - 1. Equity risk (SNP500).
  - 2. Currency risk (USD).
  - 3. Credit risk (CREDIT).
  - 4. Volatility risk (VIX).
- These risk factors stem from taking long or short positions in financial instruments that are exposed to these risks.
- Each hedge fund strategy has different exposures to these various risk factors.
  - For example, arbitrage strategies often are generally exposed to credit spread risk and market volatility risk.
  - Event-driven strategies and L/S equity strategies generally have significant exposure to equity (market beta) risk.

Example

- Conditional linear factor models used to understand hedge fund risk exposures are most likely to use factors including:
  - A. liquidity risk, operational risk, valuation risk, and systemic risk.
  - B. interest rate risk, commodity risk, margining risk, and concentration risk.
  - C. equity risk, credit risk, currency risk, and volatility risk.

- **Solution: C**
  - This reading uses a model that incorporates four factors: equity risk, credit risk, currency risk, and volatility risk. (The interest rate risk "BOND" and commodity risk "CMDTY" factors used by Hasanhodzic and Lo were dropped due to multicollinearity issues.)

Performance Contribution to a 60/40 Portfolio

- When the previously mentioned 20% allocation to hedge funds is added to a traditional 60% stock/40% bond investment portfolio, the resulting allocation is 48% stock, 32% bond, and 20% hedge fund.
- **General results**
  - Total portfolio standard deviation decreases.
  - Sharpe ratio increases.
  - Sortino ratio increases.
  - Maximum drawdown decreases in approximately one-third of portfolios.
- **The interpretation of these results** is that hedge fund strategies generally increase risk-adjusted return and provide diversification to a traditional portfolio of stocks and bonds.

Risk-adjusted Measure

- The **Sharpe ratio** is one risk-adjusted measure of performance.
  - The risk measure used to calculate the Sharpe ratio is standard deviation, so both downside and upside standard deviation result in a lower Sharpe ratio.
- The **Sortino ratio** is a similar risk-adjusted measure of performance; however, only downside deviations are considered to reflect risk.
  - Risk is measured as variability below a predefined level of return.
  - Because of the left-tail risk present in many hedge fund strategies, the Sortino ratio is generally seen as a superior measure of the risk-adjusted performance of hedge funds.

Empirical Results: Risk-adjusted Measure

- Allocations to the following strategies was found to be effective in generating superior risk-adjusted performance, based on the comparatively higher Sharpe and Sortino ratios:
  - Systematic futures.
  - Equity market neutral.
  - Global macro.
  - Event-driven hedge fund strategies.
- On the other hand, it was observed that the following fund strategies do not significantly enhance risk-adjusted performance:
  - Fund-of-funds.
  - Multi-strategy.
- Allocating a portion of a stock/bond portfolio to hedge funds **generally reduces risk and increases returns**.

Empirical Results: Risk measure-S.D.

- Perhaps not surprisingly, it was found that the following strategies resulted in the **lowest standard deviations** of returns for the overall portfolio:
  - Dedicated short-biased.
  - Bear market neutral.
- These funds also produced notably **low standard deviations**:
  - Systematic futures.
  - FoF: macro/systematic.
  - Equity market neutral.
- Funds that were found to have **little positive impact on reducing standard deviations** of the overall portfolio include:
  - Event-driven: distressed securities.
  - Relative value: convertible arbitrage.
  - An explanation
    - ✓ **Event-driven:** outcomes are either mild successes or grand failures.
    - ✓ **Relative value:** because their leveraged nature becomes a liability during times of market volatility.

Empirical Results: Risk measure-Drawdown

- **Drawdown** is defined as the peak-to-trough decline for a portfolio, generally quoted as the percentage drop between a peak and the subsequent trough.
- The hedge fund strategies that produced the **smallest maximum drawdowns**:
  - Global macro.
  - Systematic futures.
  - Merger arbitrage.
  - Equity market neutral.
- Strategies **did little to mitigate the traditional portfolio's maximum drawdown**:
  - L/S equity.
  - Event-driven: distressed securities.
  - Relative value: convertible arbitrage.
- Use of the conditional risk model can show that strategies perform relatively well during periods of market crisis because they have minimal exposure to credit risk or equity. Vice Versa.

Example

- Adding a 20% allocation of a hedge fund strategy to a traditional 60%/40% portfolio is most likely to increase the total portfolio's:
  - A. standard deviation.
  - B. maximum drawdown.
  - C. Sortino ratio.

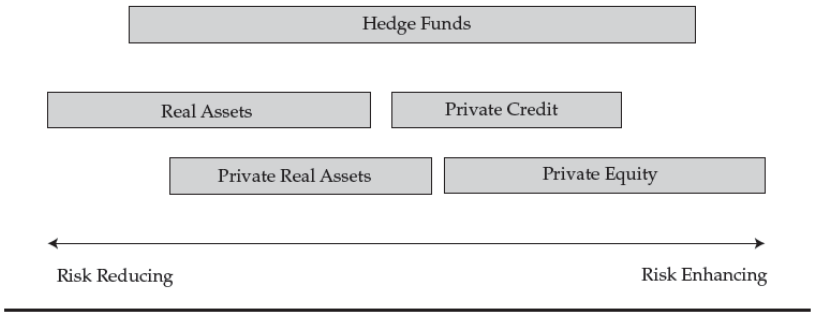
- **Solution: C**
  - Adding a 20% allocation of a hedge fund strategy to a traditional 60%/40% portfolio usually decreases total portfolio standard deviation while it increases Sharpe and Sortino ratios in the combined portfolios. An allocation to hedge funds often decreases maximum drawdown.

Asset Allocation to Alternative Investments

Roles in Multi-Asset Portfolios

- Overall, the goal of adding alternative investments to a portfolio is most often to improve the portfolio's risk and returns profile.
- Investors may seek alternative investments for **capital growth (top priority), income generation, risk diversification or safety** (preservation of value).

Exhibit 1 Alternative Investments in the Risk/Reward Continuum



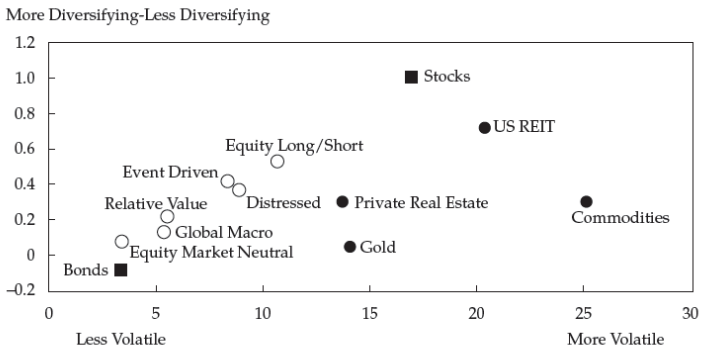
Functional roles for alternative investment

- **Functional roles**
  - **Capital growth**
    - ✓ **Top priority** for portfolios with a long-term time horizon and relatively high-return target.
    - ✓ **Public and private equity investments** would be the most obvious choices for this role.
  - **Income generation**
    - ✓ Generating **steady cash** flow stream for investors.
  - **Risk diversification**
  - **Safety**
    - ✓ Certain asset classes may play the role of safe haven when most of the risky asset classes suffer.

Diversification Potential

- Exhibit 4 illustrates the potential contributions the various alternative strategies might make to a portfolio dominated by equity risk.

Exhibit 4 Diversification Potential of Various Alternative Asset Classes



Sources: Bloomberg and authors' own data and calculations.

Roles in Multi-Asset Portfolios

- **Private equity**
  - For a portfolio of public equity securities, an allocation to private equity has limited diversification potential because public and private companies face essentially the same risk factors.
  - Thus, the main function of private equity in the portfolio is to increase expected returns.
- **Hedge funds**
  - Some hedge fund strategies, such as equity long/short or short bias, may somewhat reduce a portfolio's overall equity beta but are mainly expected to increase returns through their managers' security selection skill.
  - Other hedge fund strategies, such as merger arbitrage or global macro, may be less correlated with traditional asset classes.

Roles in Multi-Asset Portfolios

- **Real assets**
  - Assets such as commodities, farm and timberland, and infrastructure protect against inflation risk.
  - Commodity holdings (futures) can target particular subsets of inflation risk.
    - ✓ For example, energy, food, or building materials.
  - Infrastructure investments require a longer time horizon and their correlation with inflation may be limited.
    - ✓ For example, by utility rate regulations.
- **Commercial real estate**
  - Real estate investments can hedge inflation risk.
    - ✓ Both rental income and the value of properties owned may increase with inflation.

Roles in Multi-Asset Portfolios

- **Private credit**
  - This class of alternative investments include both direct lending and distressed debt.
    - ✓ **Direct lending** is primarily an income-producing investment. For a given range of credit quality, the risk-return profile tends to be similar for direct lending and **publicly traded debt**, except that direct lending has additional risk (and an expected return premium) due to its illiquidity.
    - ✓ Distressed debt has a risk-return profile **more like equity securities**, because factors specific to the issuer have a greater effect on the debt's performance than factors that affect fixed-income investments in general.

Diversifying Equity risks: Short Time Horizon

- Whether alternative assets is better risk mitigators than government bonds depend on what **time horizon** is.
- For a **short investment horizon**, the primary risk facing the investor is **returns volatility**.
- Alternative investments as an asset class appears **lower volatility and correlation**. However, these statistics are likely to **be biased downward** for a number of reasons:
  - **Appraisal-based valuations** of privately held investments result in smoothing of reported returns.
  - Databases of alternative investment returns are subject to sampling biases, such as **survivorship bias and backfill bias**, which result in downside risk being understated in the reported data.
  - Indexes of alternative investment returns reflect some degree of diversification because manager's returns in an index may have low correlations of returns with each other.

Diversifying Equity risks: Short Time Horizon

- By comparison, bonds as an asset class have had a **lower correlation** with equity returns than alternative investments.
  - In fact, over the 20 years before 2017, their correlation with equity returns has been negative.
  - As a result, an allocation to bonds is likely to reduce the volatility of an equity portfolio's returns more than an equal allocation to alternative investments.

Diversifying Equity risks: Long Time Horizon

- With a **long time horizon**, however, the primary risk is not returns volatility, but failing to achieve a minimum required rate of return over time.
  - For example, an endowment must earn an average rate of return greater than the sum of inflation and its required annual distributions.
- In this case, **alternative investments can be a better choice for diversification.**
  - Because the expected return on alternative investments is higher than that of bonds, over a long time horizon they reduce the risk of failing to meet the portfolio's return requirements.

Investment Opportunity Set

- **Traditional approaches to asset classification**
  - **Liquidity based approach**
    - ✓ Distinguish between alternative investments that are **publicly traded** and those that are **not publicly traded**.
    - ✓ Among alternative investments that are **not publicly traded**, the manager would further classify them by the **length of the time** commitment required.

	Fixed Income	Equity	Other Assets
More Liquid	Cash	Public Equity	Commodity Futures
↓	Gov. Bond Corp. Bond	Hedge funds	REITs
Less Liquid	Private Credit	Private Equity	Private Real Estate Private Real Assets

Investment Opportunity Set

- **Traditional approaches to asset classification**
  - Based on **expected performance** under distinct macroeconomic regimes.
    - ✓ **Capital growth assets:** expected to benefit from healthy economic growth. Public and private equities would belong to this category.
    - ✓ **Inflation-hedging assets:** expected to outperform when inflation expectations rise or actual inflation exceeds expectations.
    - ✓ **Deflation-hedging assets:** expected to outperform when the economy slows and inflation becomes very low or negative (mostly).

	Negative/Low Growth	High Growth
Deflation	Government bond	
Moderate Inflation		Public equity Private equity High-yield bonds Private credit
High Inflation	Inflation linked bonds Gold	Real estate Commodities

Investment Opportunity Set

- **A risk factor based approach**
  - Define asset classes involves statistically estimating their sensitivities to risk factors identified by the manager.
  - **Factors identified**
    - ✓ Equity market return
    - ✓ Size
    - ✓ Value
    - ✓ Liquidity
    - ✓ Duration
    - ✓ Inflation
    - ✓ Credit spread
    - ✓ Currency
  - Characteristics of a risk factor based approach
    - ✓ Many traditional and alternative asset classes share **similar characteristics** that can result in **high correlations**.
    - ✓ Private equity returns ≈ public equity ≈ distressed debt;
    - ✓ Private credit ≈ publicly traded high yield bonds.

Investment Opportunity Set

- **Traditional approach**
  - **Advantages**
    - ✓ Easy to communicate.
    - ✓ Relevance for liquidity management and operational considerations.
  - **Limitations**
    - ✓ Over-estimation of portfolio diversification.
    - ✓ Obscured primary drivers of risk.
- **Risk-based approach**
  - **Advantages**
    - ✓ Common risk factor identification.
    - ✓ Integrated risk framework.
  - **Limitations**
    - ✓ Sensitivity to the historical look-back period.
    - ✓ Implementation hurdles.
    - ✓ Determining which risk factors to use and how these factors are measured can be subjective.

Example

- Which of the following categories of alternative investments would be most appropriate for diversifying a portfolio of public equity?
  - A. Private equity and short-bias hedge funds.
  - B. Long-short hedge funds and distressed debt.
  - C. Commercial real estate and global macro hedge funds.

- **Solution: C**
  - Alternative investments that can diversify a public equity portfolio include commercial real estate, real assets, and hedge funds that pursue non-equity-oriented strategies. Private equity, distressed debt, and equity-oriented hedge funds are less appropriate because they are affected by many of the same risk factors as public equity.

Alternative Investment Considerations

- In addition to the risk, return, and correlation characteristics relevant to the decision to invest in the alternative asset classes, many operational and practical complexities must be considered before finalizing a decision to invest.
  - Properly defining risk characteristics;
  - Establishing return expectations;
  - Selection of the appropriate investment vehicle;
  - Operational liquidity issues;
  - Expense and fee considerations;
  - Tax considerations (applicable for taxable entities);
  - Build vs. Buy.

Investment Considerations

- **Risk consideration**
  - Several characteristics of alternative investments limit the usefulness of mean-variance optimization as a tool for determining their appropriate portfolio allocations.
    - ✓ Because of **illiquidity and valuation issues, option-like return patterns**, and the fact that returns from some strategies tend to be low or negative during a drawdown period and high in later years, we **cannot assume returns are normally distributed**.
    - ✓ Additionally, for alternative investments for which committed capital is not immediately invested by the manager, **a portfolio's effective allocation to the asset class might be less than its target.**

Investment Considerations

- **Expected return**
  - Setting return expectations for alternative investments is made more difficult by their short history relative to other asset classes and by the **limited validity of the data** that are available.
    - ✓ A suggested approach to determining an expected return for a particular class of alternative investments is to
      - ◆estimate each of its risk factor exposures,
      - ◆add the expected returns from these exposures to the risk-free rate.

Investment Vehicles

- **Investment Vehicles**
  - A typical structure for an alternative investment vehicle is a **limited partnership.**
    - ✓ With this structure, the liability of investors in the fund is limited to the amount they have committed.
    - ✓ Often these limited partnerships are registered offshore for tax or reporting reasons.
  - **Investing directly in a limited partnership** is appropriate for **large investors** that have the expertise to evaluate managers and fund strategies.
  - Investing through a **fund-of-funds** may be appropriate for investors that **lack the needed expertise**.
    - ✓ The **benefit** of a fund-of-funds is that it provides access to this asset class to investors who otherwise would not have it.
    - ✓ The **drawback** is that they charge an additional layer of fees above those charged by the underlying limited partnerships.

Investment Considerations

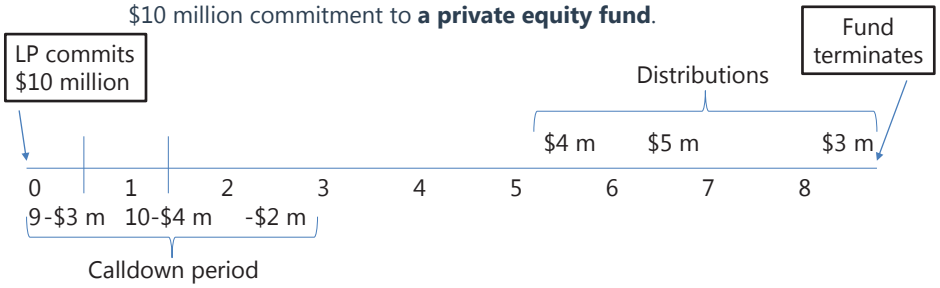
- **Investment Vehicles**
  - Some investors that are large enough to demand favorable investment terms may establish **separately managed accounts (SMAs, funds of one)** through which to access alternative investments.
    - ✓ A risk with SMAs is that general partners, when allocating certain investment opportunities to investors, may favor limited partners who are paying the fund's standard fees.
  - Some **open-ended mutual funds** and "undertakings for collective investment in transferable securities" (**UCITS**) have developed to give smaller investors access to alternative investments.

Investment Considerations

- **Liquidity concerns: liquidity risks associated with investment vehicle**
  - For funds in the private equity, private credit, real estate, and real asset sectors, liquidity provisions are often **more strict** than is typical for hedge funds.
    - ✓ **Subscriptions** are structured in "closes" for new investors, usually over a one-year period.
    - ✓ **Limited partners commit a stated amount of capital**, and the general partner will "call" this capital over an investment period (such as 3 to 5 years) as they identify investment opportunities.
    - ✓ **Redemptions** are typically not available.
    - ✓ Instead, the fund will **distribute capital over its life** (often 10 to 12 years) as it exits its investments.

Investment Considerations

- **Liquidity Concerns: Drawdown Structure**
  - The following illustrates a time line of cash flows that might occur for a $10 million commitment to **a private equity fund**.



  - Note in the figure that only $9 million of the limited partner's capital was called. A general partner is not required to call the full amount of committed capital.

Investment Considerations

- **Liquidity Concerns: Drawdown Structure**
  - **Neither capital calls nor distributions** occur on a predetermined schedule.
    - ✓ Capital may be called (or not) at any time during the calldown period.
    - ✓ Distributions can occur at any point in the fund's life, even during the calldown period.
  - Limited partners must also consider the **opportunity cost** of their committed capital during the calldown period.
    - ✓ On the other hand, investing it in higher return but less liquid investments risks missing a capital call.

Investment Considerations

- **Liquidity Concerns: liquidity risks associated with the underlying investments**
  - With respect to the liquidity of a fund's holdings, a potential issue is **whether they are consistent with the fund's redemption terms**.
    - ✓ This is mostly a consideration for hedge funds; as noted previously, other types of private investment funds generally do not offer redemptions.
  - **Equity-oriented hedge fund**
    - ✓ Hedge funds **that pursue long-only equity strategies** tend to hold relatively liquid investments that are consistent with offering redemptions monthly or quarterly.

Investment Considerations

- **Liquidity Concerns: liquidity risks associated with the underlying investments**
  - **Event-driven strategies**
    - ✓ **Frequent redemption periods** may limit a general partner's flexibility to implement strategies with long time horizons or infrequent investment opportunities.
  - **Relative value funds**
    - ✓ For example, Funds that **hold significant portions of illiquid investments**, such as some relative value funds, may restrict redemptions under certain market conditions to avoid having to liquidate these assets during crisis periods.
  - **Leverage** is another important liquidity consideration because creditors have priority of claims over limited partners.
    - ✓ **Margin calls** may force a leveraged fund to sell its most liquid holdings and be left with its less liquid investments, regardless of which holdings the general partner would otherwise prefer to keep

Investment Considerations

- **Expenses, Fees**
  - Many alternative investments involve **significant** fees and expenses.
    - ✓ For example, the "2 and 20" fee structure of many hedge funds (annual management fee 2% of assets under management, incentive fee 20% of gains)
  - Funds with calldown structures charge management fees **on the amount of committed capital**, regardless of how much of it has been called down.
    - ✓ This may generate negative returns in the early years of an investment when much of the committed capital is yet to be called.

Investment Considerations

- **Taxes**
  - Investors must ensure that their investments, and the investment vehicles used to invest, are consistent with their tax situations.
    - ✓ Some fund strategies may result in **short-term taxable income to investors**, or may be subject to **tax withholding.**
    - ✓ Tax-exempt organizations must ensure that income from a fund **will not be considered to be unrelated to** the organization's purpose, and therefore considered taxable.

Investment Considerations

- **Other considerations: Intermediaries or In-House Programs**
  - Large investors may consider developing their own program for implementing alternative investments directly rather than using intermediaries such as funds of funds.
  - An in-house program may be appropriate for an investor that needs **highly customized solutions**, desires **close** control over its investment program, or wishes to implement **co-investments** with general partners.
  - **A successful program** must be able to identify and invest with the best fund managers.
    - ✓ Even if an investor is expert at choosing managers who will generate top returns, those managers may attract more capital than they can invest productively, and therefore close their funds to new investors.
  - Investors must also be able to **perform due diligence on managers** with whom they wish to invest.
    - ✓ This requires access to their key decision makers, both before and during the life of an investment.

Example

- A limited partnership structure with a single client is known as:
  A. UCITS.
  B. a fund of one.
  C. a separately managed account.

- **Solution: B**
  - A fund of one is a limited partnership structure that has only a single client.

Example

- Cash flows from investors into a private equity limited partnership:
  A. are at the discretion of the general partner.
  B. will be 100% invested after three to five years.
  C. are made only on the establishment date of the partnership.

- **Solution: A**
  - Typically, in private equity limited partnerships, the limited partners commit a fixed amount of capital, which the general partner can call over a number of years as investment opportunities arise. Limited partners are responsible for having cash available to meet capital calls. General partners may call less than 100% of the committed capital.

Example

- Which of the following: terms describes the practice of a hedge fund designating certain of its investment holdings as exempt from the fund's ordinaiy redemption terms?
  A. Gate.
  B. Lock-up.
  C. Side pocket.

- **Solution: C**
  - Assets that are not subject to a fund's redemption terms are said to be held in a side pocket. A gate is a maximum amount an investor may redeem at one time. A lock-up is a restriction on redemptions during a period of time.

Suitability Considerations

- **Investment Horizon**
  - Private equity and private real assets are generally suitable only for investors with long time horizons (15 years or more).
- **Expertise**
  - Alternative investment strategies are largely based on the premise that **skilled managers (large investors)** can create value through **active management.**
    - ✓ Alternative investments may **not** be suitable for investors whose philosophy is grounded in a belief in the price-efficiency of markets.
- **Governance**
  - The investor should have a formal investment policy with clear objectives, put decision-making power in the hands of experts, and have a reliable reporting framework.
- **Transparency**
  - Investors in alternative investments must be comfortable with a lower level of transparency than is generally available with traditional investments.

Approaches to Asset Allocation

- A suggested approach to including alternative investments in an asset allocation decision is to do it in two stages:
  - First with only the traditional asset classes;
  - Then also considering alternative investments.
    - ✓ The second process can be assisted by statistical tools such as:
      - ◆Monte Carlo simulation.
      - ◆Mean-variance optimization.
      - ◆Risk factor based optimization.
    - ✓ These approaches can be used individually or in combination.

Approaches to Asset Allocation

- **Challenges in modeling the risk and return properties of alternatives**
  - Because asset valuations for many alternative investments are based on **appraisals**, returns data are likely to be artificially smoothed and are often stale.
  - The **distribution of returns** is also known to be **non-normal**, exhibiting skew and excess kurtosis to a greater extent than traditional asset classes.
- **Incorporate non-normality** into analyses.
  - use **empirically observed asset returns** instead of working with the normal distribution
    - ✓ A further limitation is the relatively short history of alternative investments, which may result in **small-sample and time-period biases**.
- One method for **modeling a distribution with fat tails** (positive excess kurtosis) is to define risk and return properties for two or more distinct market environments.
  - For example, a normal period and a high-volatility period.

Approaches to Asset Allocation

- **Monte Carlo simulation**
  - First, we discuss how we can simulate risk factor or asset return scenarios that exhibit the skewness and kurtosis commonly seen in alternative investments.
  - Second, we illustrate simulation-based risk and return analytics over a long time horizon in a broad asset allocation context.
  - **Steps of model construction process**
    - ✓ 1. Decide between asset class returns or risk factors as the variables to be simulated.
    - ✓ 2. Establish the quantitative framework, for example by accounting for properties like mean reversion, fat-tailed distributions, or unstable correlations.
    - ✓ 3. If the model is based on risk factors, translate them to asset class returns.
    - ✓ 4. Use the resulting asset class return scenarios to develop meaningful outputs, such as the probability of a shortfall to a portfolio's required or target rate of return.

Approaches to Asset Allocation

- **Optimization techniques**
  - Mean–variance optimization (MVO) typically over-allocates to alternative asset classes, because:
    - ✓ risk is underestimated because of stale or infrequent pricing;
    - ✓ the underlying assumption that returns are normally distributed.
  - Practitioners usually address this bias towards alternatives by **establishing limits on the allocations to alternatives.**
  - Optimization methods that **incorporate downside risk** (mean–CVaR optimization) or **take into account skew** may be used to enhance the asset allocation process.
  - **Limitation**
    - ✓ **Small** changes in the inputs may generate **significant** changes in optimal asset allocations.

Approaches to Asset Allocation

- **Risk factor based optimization**
  - Risk factor based optimization is similar to MVO, but instead of modeling asset classes by their return and risk characteristics, the investor **models risk factors and factor return expectations**.
  - A risk factor based approach requires the additional step of translating the optimized risk exposures to an asset allocation to achieve them.
    - ✓ For example, both public and private equity provide exposure to economic growth risk, but the allocation to each depends on the desired exposure to liquidity risk.
  - **Limitations**
    - ✓ Asset classes' return **sensitivity** to some risk factor exposures might not be stable over time.
    - ✓ **Correlations** among risk factors may behave like correlations among asset class returns and increase during periods of financial stress.

Liquidity Planning

- A portfolio must be managed in a way that **meets its capital commitments** while still **providing required liquidity**.
- Here we will explore the challenges with private investment liquidity planning with **three primary considerations**:
  - 1 How to achieve and maintain the desired allocation.
  - 2 How to handle capital calls.
  - 3 How to plan for the unexpected.

Liquidity Planning

- **Achieve and maintain the desired allocation**
  - Cash flows for a typical private investment partnership are capital calls in the early years and distributions in the later years.
- **A simple model** (estimate the cash flows to and from a fund)
  - **Capital Contribution = Rate of Contribution × (Capital Commitment – Paid-in-Capital)**
    - ✓ Capital contribution (C) in year t;
    - ✓ PIC denotes the already paid-in capital.
  - Distributions from a fund can be modeled as percentages of its net asset value.
  - **Distributions in period t = percentage to be distributed in period $_t$ × [NAV in period $_{t-1}$ × (1+growth rate)]**
    - ✓ growth rate = IRR of its investments
    - ✓ NAV in period t = NAV in period $_{t-1}$ × (1 + growth rate) + contributions in period $_t$ – distributions in period $_t$

Example

- The NAV of an investor's share in a private renewable energy fund was €30 million at the end of 2020. All capital has been called. The investor expects a 20% distribution to be paid at the end of 2021. The expected growth rate is 12%. What is the expected NAV at year-end 2022?

- **Solution**
  - The expected NAV at year-end 2022 is €30,105,600. The expected distribution at the end of 2021 is €6.72 million [(€30 million x 1.12) x 20%]. The NAV at year-end 2021 is therefore [(€30 million x 1.12) − 20%] x 1.12% = €30,105,600.

Liquidity Planning

- **Managing the capital call**
  - A crucial aspect of liquidity planning is **having cash available to meet capital calls**.
  - A **suggested approach** is to invest it in publicly traded securities that may be viewed as proxies for the private investments to which they are committed.
    - ✓ For example, capital committed to private real estate but not yet called could be invested in publicly traded real estate investment trusts.
- **Preparing for the unexpected**
  - Capital calls, distributions, growth rates, and even fund lifetimes may turn out **significantly different than expected**.
    - ✓ An investor should **stress-test liquidity planning models against unexpected events** such as delayed fund distributions when expected distributions have been earmarked to meet capital calls.

Monitoring Programs

- **Overall Investment program monitoring**
  - Its performance should be evaluated in the context of return, risk, income, and safety, rather than simply measured against a benchmark.
  - One reason that measuring against a benchmark or peer group can be misleading is the difficulty of selecting a representative one.
    - ✓ Because many alternative investment strategies depend heavily on active management, any benchmark chosen is unlikely to be directly comparable to a portfolio's actual investments in the asset class.
    - ✓ In addition, published indexes are often inconsistent with each other in the way they define various alternative investment strategies.

Considerations in Monitoring Programs

- **Performance Evaluation**
  - Monitoring of alternative investments can be challenging because their performance reporting can be **infrequent** and come with **significant time lags**.
  - A further complication with private investments is that they often report internal rates of return rather than time-weighted rates of return.
    - ✓ IRR is influenced by the timing of capital calls and distributions, and therefore, may be subject to manipulation.
    - ✓ Investors may prefer to monitor a private fund's multiple on invested capital (MOIC). (MOIC is a private equity measure that divides the current value of the underlying companies plus any distributions received by the total invested capital.)
  - If capital is **returned quickly** (thereby possibly producing extraordinarily high IRRs), the investor may want to put greater emphasis on the **MOIC** measure. Similarly, funds that **return capital more slowly** than expected might want to put greater weight on the **IRR** measure.

Considerations in Monitoring Programs

- **Monitoring the Firm and the Investment Process**
  - A fund's "**key persons**" are typically specified in its documents.
  - **The manager's interests should be aligned with the investor's interests.**
  - **Style drift:** Because managers have a great deal of discretion over how they invest capital, investors should monitor a fund's holdings over time for signs of style drift.
  - **Risk Management:** Monitoring a fund's risk management framework is important, especially for leveraged strategies.
  - **Client/asset turnover:** An investor should observe the profile of a fund's other investors and judge whether they are likely to remain committed for the long term.

Considerations in Monitoring Programs

- **Monitoring the Firm and the Investment Process**
  - A large or unexpected increase in **new investors** may make **more capital available to a manager** than he has attractive opportunities to use.
    - ✓ If this leads the manager to pursue lesser opportunities, the performance of the fund as a whole may suffer.
  - A fund should have reliable auditors, custodians, and other third-party **service providers.**
    - ✓ If these relationships change, an investor should understand whether it is for a positive reason (e.g., the fund outgrows the capabilities of a service provider and needs a larger one)
    - ✓ or otherwise (e.g., an auditor quits a relationship because of a manager's actions).

It's not an end but just the beginning.

Search for knowledge, read more, sit on your front porch and admire the view without paying attention to your needs.

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