



Alternative Investments

CFA一级强化班

讲师：韩霄



韩霄

10年授课，5,000+授课课时

资质证书

- 通过特许金融分析师（CFA）三级
- 注册会计师（CPA）
- 美国注册财务策划师（RFP）
- 量化金融分析师（AQF）
- 注册金融风险管理师（CFRM）

服务客户

- 中国银行、广发证券、中国建设银行、中国工商银行、国家进出口银行、交通银行、招商银行、农业银行、上海银行、太平洋保险、平安证券、兴业证券、国泰君安等。

工作经历

- 金程教育资深培训师、资深证券分析师、美国注册财务策划师协会（大中华管理中心）特聘资深专家；
- 在财务分析、估值建模、兼并收购、投资理财、税务筹划、资产证券化等方面拥有丰富的管理与实战经验。曾就职于全球顶级咨询公司与会计师事务所，并担任某世界500强企业投资总监，主导并参与多个大型企业兼并收购及IPO项目，投资标的及服务的客户包括阿里巴巴、中国中铁、中国南车、TPG Capital、L Capital、野村证券等。
- 先后为数十家国内外银行、保险公司、证券公司、世界500强企业提供专业培训，备受好评，服务的客户包括中国银行、中国建设银行、国家进出口银行、国泰君安等多家大型金融机构。

Topic Weightings in CFA Level I

Topics	Weights (%)
Quantitative Methods	8-12
Economics	8-12
Financial Statement Analysis	13-17
Corporate Issuers	8-12
Equity	10-12
Fixed Income	10-12
Derivatives	5-8
Alternative Investments	5-8
Portfolio Management	5-8
Ethical and Professional Standards	15-20

课件使用说明

● 强化班知识点说明和使用指南

序号	课件元名称（知识点）	必考	高频	低频
1	Alternative Investment Features	1	0	0
2	Alternative Investment Methods	0	1	0
3	Alternative Investment Structures	0	1	0
4	Alternative Investment Performance	0	1	0
5	Alternative Investment Returns	1	0	0

- 必考知识点指的是近10年考试中考试频率大于等于75%的考点，在强化班中重点讲解，必须掌握；
- 高频知识点指的是近10年考试中考试频率介于25%到75%的考点，在强化班中重点讲解，必须掌握；
- 低频知识点指的是近10年考试中考试频率小于25%的考点，在基础班中重点讲解，学员可以根据自己的掌握情况在基础班中巩固学习；
- 本学科知识点合计22个，其中必考知识点5个，高频知识点6个，低频知识点11个，掌握必考和高频考点覆盖了近10年96.06%的题目。

Alternative Investments

1. Alternative Investment Features, Methods, and Structures
2. Alternative Investment Performance and Returns
3. Investments in Private Capital: Equity and Debt
4. Real Estate and Infrastructure
5. Natural Resources
6. Hedge Funds
7. Introduction to Digital Assets

冲刺笔记

1. 另类投资的特点、方法和结构
2. 另类投资的表现和回报
3. 私人资本的投资：股票和债务
4. 房地产和基础设施
5. 自然资源
6. 对冲基金
7. 数字资产介绍

Framework

Module



Alternative Investment Features, Methods, and Structures

1. Alternative Investment Features
2. Alternative Investment Methods
3. Alternative Investment Structures

Alternative Investment Features

- describe features and categories of alternative investments

— Introduction of Alternative Investments —

- **Traditional vs. Alternative Investments**

- Traditional: long-only investments in stocks, bonds, and cash, etc.
- Alternative: other investment vehicles which fall outside the scope of traditional investments, extensive use of leverage.

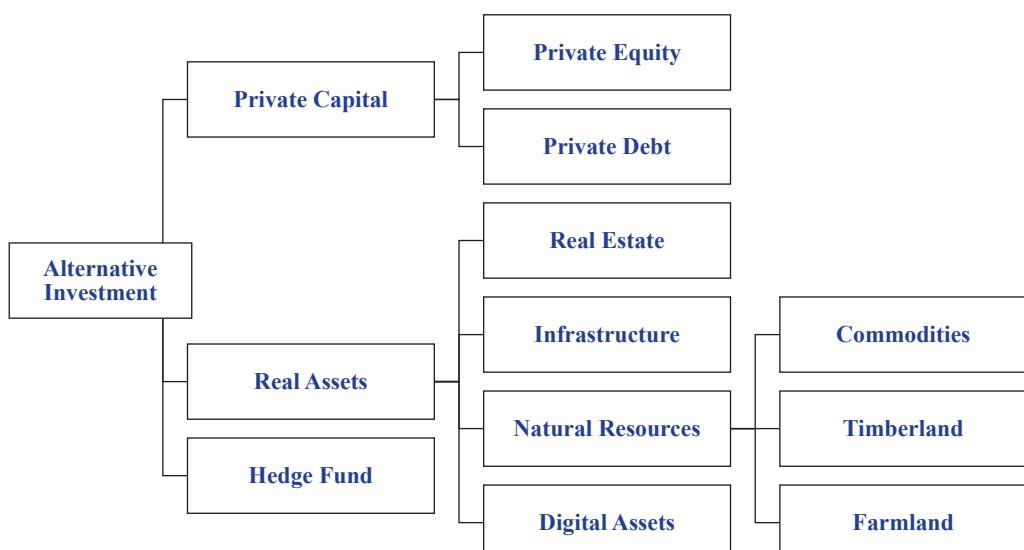
- **Features that may distinguish alternative investments include the following:**

- The need for specialized knowledge to value cash flows and risks;
- Typically low correlation of returns with more traditional asset classes;
- Illiquidity, long investment time horizons, and large capital outlays.

- **These features lead to the following alternative investment characteristics:**

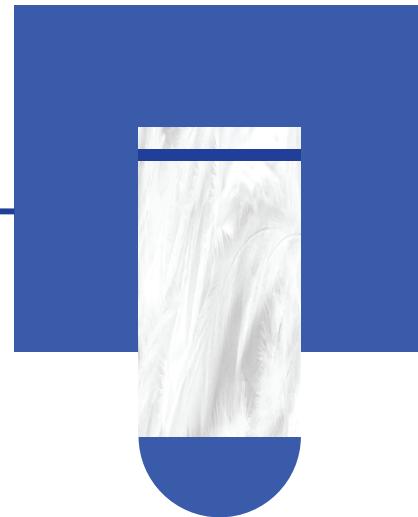
- Different investment structures due to the challenges of direct investment;
- Incentive-based fees to address/minimize information asymmetry between managers and investors;
- Performance appraisal challenges.

— Types of Alternative Investments —



Alternative Investment Methods

- compare direct investment, co-investment, and fund investment methods for alternative investments



Investment Methods of Alternative Investments

● Fund Investing (indirect)

- The investor contributes capital to a fund, and the fund identifies, selects, and makes investments on the investor's behalf.

● Co-Investing (direct & indirect)

- The investor invests in assets indirectly through the fund but also possesses rights to invest directly in the same assets.

● Direct Investing (direct)

- Occurs when an investor makes a direct investment in an asset without the use of an intermediary.
- Typically reserved for larger and more sophisticated investors and usually applies to private equity and real estate.

Fund Investing

● Fund Investing

○ Advantages

- ✓ Fund managers offer investment services and expertise;
- ✓ Lower level of investor involvement compared with the direct and co-investing methods;
- ✓ Access to alternative investments without possessing a high degree of investment expertise;
- ✓ Potentially valuable diversification benefits;
- ✓ Lower minimum capital requirements.

○ Disadvantages

- ✓ Costly management and performance fees;
- ✓ Investor must conduct thorough due diligence when selecting the right fund because of the wide dispersion of fund manager returns.

Co-Investing

● Co-Investing

○ Advantages

- ✓ Investors can learn from the fund's process to become better at direct investing;
- ✓ Reduced management fees;
- ✓ Allows more active management of the portfolio compared with fund investing and allows for a deeper relationship with the manager.

○ Disadvantages

- ✓ Reduced control over the investment selection process compared with direct investing;
- ✓ May be subject to adverse selection bias;
- ✓ Requires more active involvement compared with fund investing, which can be challenging if resources and due diligence experience are limited.

Direct Investing

● Direct Investing

○ Advantages

- ✓ Avoids paying ongoing management fees to an external manager;
- ✓ Greatest amount of flexibility for the investor;
- ✓ Highest level of control over how the asset is managed.

○ Disadvantages

- ✓ Requires more investment expertise and a higher level of financial sophistication;
- ✓ Less access to a fund's ready diversification benefits or the fund manager's sourcing network;
- ✓ Requires greater levels of due diligence because of the absence of a fund manager;
- ✓ Higher minimum capital requirements;
- ✓ Fund managers may enjoy reputational benefits that see them secure participation in attractive investments unavailable to certain direct investors operating on their own behalf.

Summary Alternative Investment Methods

Investment Methods of Alternative Investments

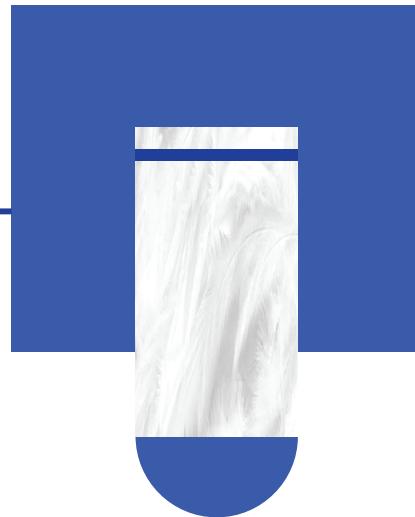
Fund Investing

Co-Investing

Direct Investing

Alternative Investment Structures

- describe investment ownership and compensation structures commonly used in alternative investments



Compensation Structures

● Management Fee

- Based on **assets under management** (for hedge funds) or **committed capital** (for PE funds).

● Performance Fee (incentive fee, carried interest)

- Based on profits net of (or before) management fee.

- E.g. **"2 and 20"**

- ✓ 2% management fee.
- ✓ 20% incentive fee for hedge funds.

- Hurdle rate**

- ✓ A **minimum rate of return** that the GP must exceed in order to earn the performance fee.

- ✓ **Hard** hurdle rate

- ✓ **Soft** hurdle rate

- High water mark** → highest value reported

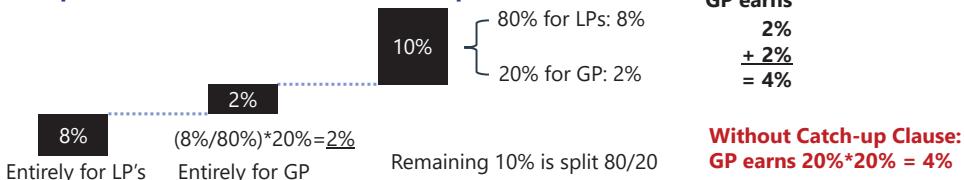
- ✓ Protect clients from paying twice for the same performance.

Compensation Structures

● Catch-up Clause

- For a GP earned 20% on an investment with "2 and 20" fee structure and hurdle rate of 8%, LP receives the entirety of the first 8% profit, the GP would receive the entirety of the next 2% profit—because 2% out of 10% amounts to 20% of the profits accounted for so far, as the catch-up clause stipulates—and the remaining 10% would be split 80/20 between the LPs and the GP.

- 20% profits with soft hurdle and catch-up clause**



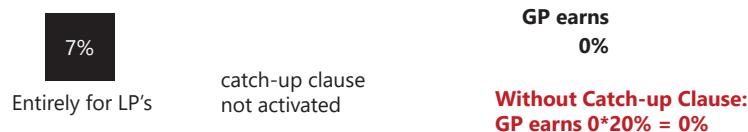
- 9% profits with soft hurdle and catch-up clause**



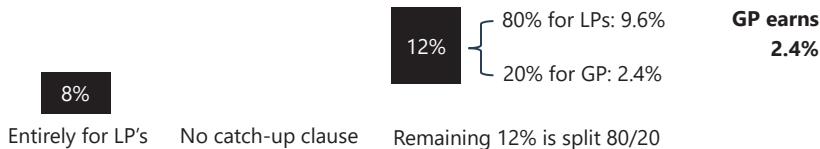
Compensation Structures

● Catch-up Clause

7% profits with soft hurdle and catch-up clause



20% profits with hard hurdle



Compensation Structures

● Waterfall

○ Represents the distribution method that defines the order in which allocations are made to LPs and GPs.

○ Deal-by-deal (American) waterfalls

- ✓ Performance fees are collected on a per-deal basis.
- ✓ **More advantageous** to the **GP**.

○ Whole-of-fund (European) waterfalls

- ✓ Performance fees occur at the aggregate fund level (i.e., after all investments have been exited).
- ✓ **More advantageous** to the **LP**.

● Clawback Provision

○ A clawback provision reflects the **right of LPs** to reclaim part of the GP's performance fee.

Summary

Alternative Investment Structure

Ownership Structures
Compensation Structures

Summary

Module: Alternative Investment Features, Methods, and Structures

Alternative Investment Features

Alternative Investment Methods

Alternative Investment Structures

Module



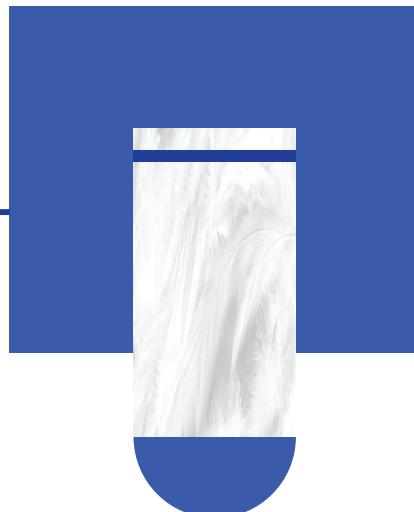
Alternative Investment Performance and Returns

1. Alternative Investment Performance

2. Alternative Investment Returns

Alternative Investment Performance

- describe the performance appraisal of alternative investments



Investment Life Cycle

● Investment Life Cycle

- Alternative investments usually involve a longer investment life cycle with distinct phases characterized by net cash outflows and inflows that complicate periodic return comparisons.
- **Capital commitment:**
 - ✓ Alternative managers identify and select appropriate investments with either an immediate or a delayed **commitment of capital** (known as a capital call).
 - ✓ Returns are usually negative over this phase because fees and expenses are immediately incurred prior to capital deployment and assets may generate little or no income during this first phase.

Investment Life Cycle

● Investment Life Cycle

- **Capital deployment:**
 - ✓ Alternative managers deploy funds to engage in construction or make property improvements in the case of real estate or infrastructure, incur expenses in the turnaround phase of a mature company in the case of private equity, or initiate operations for a startup using venture capital.
 - ✓ Cash outflows typically exceed inflows, with management fees further reducing returns.
- **Capital distribution:**
 - ✓ When the turnaround strategy, startup phase, or property improvements are completed and if the investment is successful, the underlying assets appreciate in price and/or generate income in excess of costs, causing fund returns to accelerate.
 - ✓ The fund may realize substantial capital gains from liquidating or exiting its investments, which may involve an initial public offering (IPO) for venture capital or the sale of properties in the case of real estate.

Multiple of Invested Capital

- Private equity and real estate investing involve long holding periods.
- Private equity funds can appear to have *low volatility* because of the **lag** in their mark-to-market process.
- IRR approach
 - ✓ Key metric used to assess longer-term alternative investments in the private equity and real estate.
 - ✓ Assumptions:
 - a **financing rate** to use for outgoing cash flows.
 - a **reinvestment rate** to use for incoming cash flows.
- Multiple of invested capital (MOIC)
 - ✓ MOIC = (Realized value of investment + Unrealized value of investment) / (Total amount of invested capital)
 - ✓ Total value of all distributions and residual asset values relative to an initial total investment.
 - ✓ Completely ignores the timing of cash flows.

Use of Borrowed Funds

● Use of Borrowed Funds

- Financial leverage has the effect of magnifying both gains and losses by allowing investors to take a market position that is larger than the capital committed.
- $r_L = \text{Leveraged portfolio return}/\text{Cash position} = [r \times (V_c + V_b) - (V_b \times r_b)]/V_c$
- $r_L = r + V_b/V_c(r - r_b)$

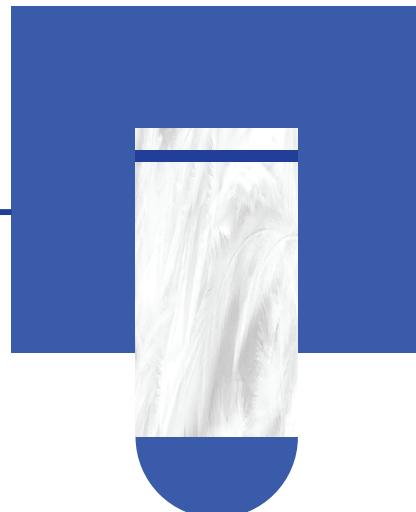
Summary

Alternative Investment Performance

Performance Appraisal
Investment Life Cycle
Multiple Of Invested Capital
Use of Borrowed Funds
Valuation
Fees

Alternative Investment Returns

- calculate and interpret alternative investment returns both before and after fees



Alternative Investment Return Calculations

- **Return calculations**

- Vary among alternative investments based on the form of the investments.
- The GP's return in currency terms (R_{GP}) is as follows:
 - ✓ $R_{GP} = (P_1 \times r_m) + \max[0, (P_1 - P_0) \times p]$
- Investor's periodic rate of return, r_i , as follow:
 - ✓ $R_i = (P_1 - P_0 - R_{GP}) / P_0$

Summary Alternative Investment Returns

Redemptions

Custom Fee Arrangements

Alternative Investment Return Calculations

Relative Alternative Investment Returns and Survivorship Bias

Summary

Model: Alternative Investment Performance and Returns

Alternative Investment Performance

Alternative Investment Returns

Module

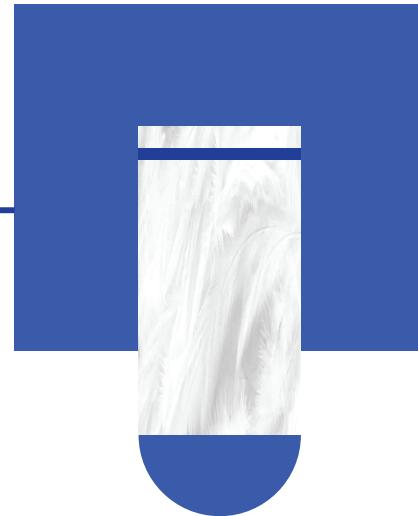


Investments in Private Capital: Equity and Debt

1. Private Equity Investment Characteristics
2. Private Debt Investment Characteristics
3. Diversification Benefits of Private Capital

Private Equity Investment Characteristics

- explain features of private equity and its investment characteristics



— Categories of Private Equity – Venture Capital —

● The Stage of Venture Capital Investing

- **Pre-seed capital or angel investing:** At the idea stage, funds may be used to develop a business plan and to assess market potential. The amount of financing here is typically small and sourced from individuals.
- **Seed-stage financing, or seed capital:** Generally supports product development and marketing efforts, including market research. This is the first stage at which VC funds usually invest.
- **Early-stage financing, or start-up stage financing:** Goes to companies moving toward operation but prior to commercial production or sales, in both of which early-stage financing may be injected to initiate.
- **Later-stage financing:** After commercial production and sales have begun but before an IPO. Funds may be used to support initial growth, a major expansion (such as a physical plant upgrade), product improvements, or a major marketing campaign.
- **Mezzanine stage:** Prepares a company to go public as it continues to expand capacity and enhance its growth trajectory.

———— Private Equity Exit Strategies ——

- **Common Exit Strategies:**

- **Trade sale:** Sell a portfolio company to a competitor or another strategic buyer.
- **IPO:** Sell all or some shares of a portfolio company to the public.
- **Special purpose acquisition company (SPAC):** The special purpose acquisition company technique starts as a shell company via an IPO through which sponsors raise a blind pool of cash aimed for merger or acquisition with private firms.
- **Recapitalization:** The company issues debt to fund a dividend distribution to equity holders (the fund). This is not an exit, in that the fund still controls the company, but is often a step toward an exit.
- **Secondary sale:** Sell a portfolio company to another private equity firm or a group of investors.
- **Write-off/liquidation:** Reassess and adjust to take losses from an unsuccessful outcome.

Summary

Private Equity Investment Characteristics

Introduction of Private Equity

Categories of Private Equity - LBOs

Stages of Venture Capital

Private Equity Exit Strategies

Summary

Module: Investments in Private Capital: Equity and Debt

Private Equity Investment Characteristics

Private Debt Investment Characteristics

Diversification Benefits of Private Capital

Module

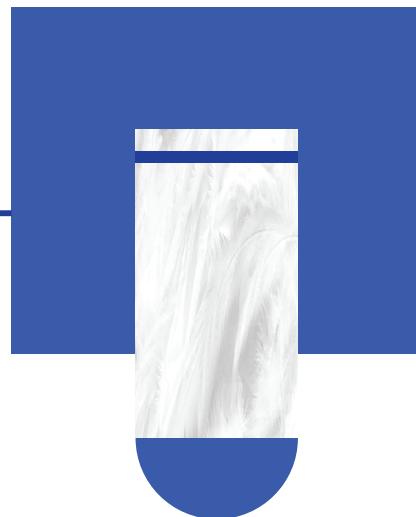


Real Estate and Infrastructure

1. Real Estate Features
2. Real Estate Investment Characteristics
3. Infrastructure Investment Features
4. Infrastructure Investment Characteristics

Real Estate Features

- explain features and characteristics of real estate



Direct Private Investing

- **Direct private investing**
 - Involves purchasing a property and originating debt for one's own account.
- **There are distinct advantages to owning real estate directly for property investors:**
 - Control;
 - Tax benefits: The owners can reduce their taxable income using non-cash property depreciation expenses and tax-deductible interest expenses;
 - Diversification: Real estate has exhibited low correlation with other asset classes.
- **There are also disadvantages to investing directly in property:**
 - Complexity;
 - Need for specialized knowledge;
 - Significant capital needs;
 - Concentration risk;
 - Lack of liquidity.

Indirect Private Investing

- **Indirect private investing**

- Different investors to acquire one or several properties, the exposure is indirect through a variety of investment vehicles.
- Can be public or private: Limited partnerships, mutual funds, equities, REITs, and exchange-traded funds (ETFs).

- **Three main forms of REIT**

- Equity REITs: Invest in properties outright or through partnerships and joint ventures;
- Mortgage REITs: Underwrite loans to real estate (mortgages) or invest in MBS;
- Hybrid REITs: Invest in both these types.

- **Advantages of REIT**

- The main appeal of the REIT structure is the elimination of double corporate taxation;
- Greater transparency;
- Not forced to sell the company's underlying real estate like open-end funds experiencing mass redemptions;
- REITs have the know-how to manage the properties.

Summary Real Estate Features

- Description of Real Estate
- Features of Real Estate Investments
- Forms of Real Estate Investing
- Direct Private Investing
- Indirect Private Investing

Infrastructure Investment Features

- explain features and characteristics of infrastructure

Introduction of Infrastructure

- **Definition:** real, capital intensive, long-lived assets, which are intended for public use and provide essential services.
- **Public-private partnership (PPP) approach (common):** Governments and investors each have a stake.
- **Categories of Infrastructure Investments**
 - Economic infrastructure assets support **economic activity**. (E.g. transportation assets, information & communication technology (ICT) assets, and utility and energy assets)
 - Social infrastructure assets are directed toward **human activities**.

Stages of Infrastructure Development

● Stages of Infrastructure Development

- **Greenfield investments**, developing new assets and new infrastructure, are opportunistic investments.
- **Brownfield investments** expand existing facilities and may involve privatization of public assets or a sale leaseback of completed greenfield projects.
- **Secondary-stage investments** invest in existing infrastructure facilities or fully operational assets that do not require further investment or development over the investment horizon.

Summary Infrastructure Investment Features

Introduction of Infrastructure
Stages of Infrastructure Development
Forms of Infrastructure Investments

Summary

Module: Real Estate and Infrastructure

Real Estate Features

Real Estate Investment Characteristics

Infrastructure Investment Features

Infrastructure Investment Characteristics

Module

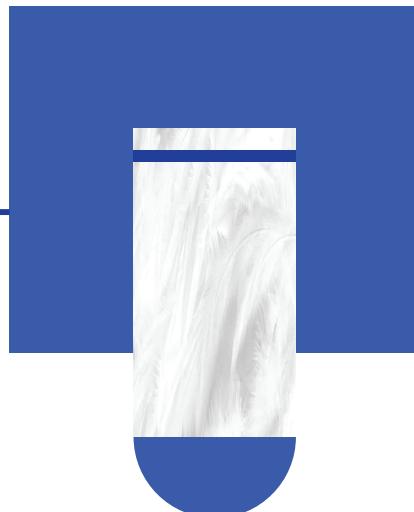


Natural Resources

1. Natural Resources Investment Features
2. Commodity Investment Forms
3. Natural Resource Investment Risk, Return, and Diversification

Commodity Investment Forms

- describe features of commodities and their investment characteristics



Basics of Commodity Pricing

● The Price of a Futures Contract

$$\textcircled{O} \quad F_0(T) = S_0 e^{(r+c-i)T}$$

- ✓ c is the cost of carry;
- ✓ i is the convenience yield;
- ✓ r is the risk-free rate;
- ✓ T is the time to the expiration of the forward contract.
- ✓ The buyer of a futures contract does not have immediate access to the commodity, but will receive it in the future → loss of convenience yield.

Basics of Commodity Pricing

● Relationship between Spot Prices and Future Prices

○ Contango

- ✓ **Futures price > Spot price**

○ Backwardation

- ✓ **Futures price < Spot price**

- Futures markets that are dominated by **long hedgers** (users of the commodity who buy futures to protect against price increases) tend to be in **contango**.
- Futures markets that are dominated by **short hedgers** (producers of the commodity who short futures to protect against price decreases) tend to be in **backwardation**.

Summary

Commodity Investment Forms

Commodity Investment Features

Characteristics of Commodity Investment

Basics of Commodity Pricing

Summary

Module: Natural Resources

Natural Resources Investment Features

Commodity Investment Forms

Natural Resource Investment Risk, Return, and Diversification

Module

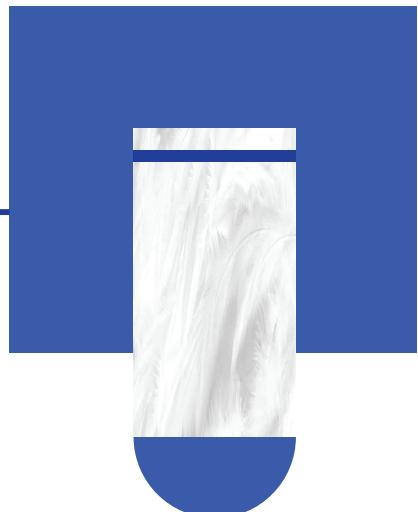


Hedge Funds

1. Hedge Fund Investment Features
2. Hedge Fund Investment Forms
3. Hedge Fund Investment Risk, Return, and Diversification

Hedge Fund Investment Features

- ❑ explain investment features of hedge funds and contrast them with other asset classes



Introduction of Hedge Funds

- **Hedge Funds:** distinguished by their investment approach rather than the underlying investments.
 - Long and short positions;
 - Highly leveraged;
 - Derivative positions.
- Hedge funds are typically classified by strategy. One such classification includes **five broad categories of strategies:**
 - Equity hedge funds,
 - Event-driven hedge funds,
 - Relative value hedge funds,
 - Opportunistic hedge funds,
 - Multi-manager hedge funds.

Strategies of Hedge Funds

- **Equity Hedge Fund Strategies**
 - Seek to profit from *long or short* positions in publicly traded equities and derivatives with equities as their underlying assets.
 - *Most* equity hedge strategies use a *bottom-up* strategy.
- **Types of Equity Hedge Strategies**
 - **Market Neutral:** Use quantitative, fundamental, and technical analysis to identify under- and overvalued equity securities. The hedge fund takes long positions in undervalued securities and short positions in overvalued securities, while seeking to maintain a market-neutral net position.
 - ✓ Ideally, the manager achieves an overall beta relative to the market close to zero.
 - **Fundamental Long/Short Growth:** Takes long positions in companies that are trading at inexpensive levels compared to their potential intrinsic value and shorts those that trade in the other direction.

Strategies of Hedge Funds

- **Types of Equity Hedge Strategies(cont.)**
 - **Fundamental growth:** Use fundamental analysis to identify companies expected to exhibit high growth and capital appreciation
 - **Fundamental value:** Use fundamental analysis to identify undervalued and unloved companies for which there is the possibility that a corporate turnaround, with future revenue and cash flow growth, will result in higher valuations.
 - **Short Bias:** Use quantitative, technical, and fundamental analysis to short the overvalued equity securities with limited or no long-side exposures.

Strategies of Hedge Funds

● Event-Driven Strategies

- Seek to profit from defined events that are expected to change valuations, typically involving changes in corporate structure, such as an acquisition or restructuring.
- Considered "*bottom up*" strategy.

● Types of Event-Driven Strategies

- **Merger arbitrage:** Long the stock of the company being acquired, and short the stock of the acquiring company.
- **Distressed/restructuring:** Focus on the securities of companies either in bankruptcy or perceived to be near bankruptcy.
- **Special situations:** Focus on opportunities to buy equity of companies engaged in security issuance or repurchase, special capital distributions, rescue finance, asset sales/spin-offs, or other catalyst-oriented situations.
- **Activist:** Managers secure sufficient equity holding to allow them to seek a position on the company board and influence corporate policies or direction.

Strategies of Hedge Funds

● Relative Value Strategies

- Seek to profit from a pricing discrepancy between related securities.

● Types of Relative Value Strategies

- **Convertible bond arbitrage:** Exploit a perceived mispricing between a convertible bond and its component parts: the underlying bond and the embedded call option.
- **Fixed income (General):** Focus on the relative value within the fixed income markets, with an emphasis on sovereign debt (relative value rates) and sometimes the relative pricing of investment-grade corporate debt (relative value credit).
- **Fixed income (Asset backed, mortgage backed, and high yield):** Focus on the relative value of various higher-yielding securities, such as MBS, ABS, high-yield loans and bonds, and their derivatives.
- **Multi-strategy:** Trade relative value within and across asset classes or instruments.

Strategies of Hedge Funds

● Opportunistic Strategies

- Funds that focus on macro events and commodity trading. These strategies may often use index ETF securities or derivatives in addition to individual securities.

● Types of Opportunistic Strategies

- **Macro strategies:**
 - ✓ Emphasize a *top-down approach* to identify economic trends.
 - ✓ Use long and short positions to profit from a view on overall market direction as it is influenced by major economic trends and events.
- **Managed futures:**
 - ✓ Funds are actively managed funds making diversified directional investments primarily in the futures markets on the basis of technical and fundamental strategies.
 - ✓ Managed futures funds are also known as commodity trading advisers (CTAs) because they historically focused on commodity futures.

Distinguishing Characteristics of Hedge Fund Investments

- **Distinguishing Characteristics of Hedge Fund Investments**

- Less legal and regulatory constraints;
- Flexible mandates permitting the use of shorting and derivatives;
- A larger investment universe on which to focus;
- Aggressive investment styles that allow concentrated positions in securities offering exposure to credit, volatility, and liquidity risk premiums;
- Relatively liberal use of leverage;
- Liquidity constraints that include lockups and liquidity gates;
- Relatively high fee structures involving management and incentive fees.

Summary

Hedge Fund Investment Features

Introduction of Hedge Funds

Strategies of Hedge Funds

Distinguishing Characteristics of Hedge Fund Investments

Hedge Fund Investment Forms

- describe investment forms and vehicles used in hedge fund investments

— Indirect Hedge Fund Investment Forms —

- **Indirect Hedge Fund Investment Forms**

- Makes hedge fund exposures more accessible to smaller institutional and larger retail investors;
- For those who may lack specialized skills in managing certain asset types or want to create multiple and concurrent exposures to different strategies.

- **Hedge fund replication ETFs, investor motivated by:**

- Reducing management costs;
- Increasing performance transparency;
- Improving liquidity.

— Indirect Hedge Fund Investment Forms —

- **Funds of Hedge Funds: managed portfolio of hedge funds**

- **Advantages:**

- ✓ Direct diversification benefits across fund strategies, investment regions, and management styles;
- ✓ Lower investment minimums;
- ✓ Reduced lockup periods;
- ✓ Better exit liquidity;
- ✓ FOFs have some expertise in conducting due diligence on hedge funds.

- **Disadvantage:**

- ✓ FOFs managers charge an additional layer of fees beyond the fees charged by the individual hedge funds in the portfolio.
- ✓ Greater liquidity in funds of funds may result in weaker performance due to fund redemptions in times of market turmoil.

Summary Hedge Fund Investment Forms

Characteristics of Hedge Funds

Direct Hedge Fund Investment Forms

Indirect Hedge Fund Investment Forms

Summary

Module: Hedge Funds

Hedge Fund Investment Features

Hedge Fund Investment Forms

Hedge Fund Investment Risk, Return, and Diversification

Module

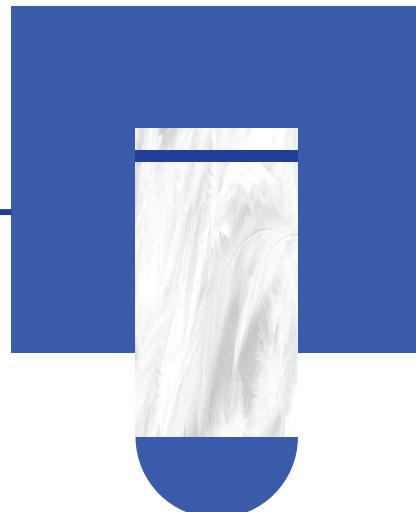


Introduction to Digital Assets

1. Distributed Ledger Technology
2. Digital Asset Investment Features
3. Digital Asset Investment Forms
4. Digital Asset Investment Risk, Return, and Diversification

Distributed Ledger Technology

- ❑ describe financial applications of distributed ledger technology



— Distributed Ledger Technology —

- Potential benefits of using distributed ledger technology include:

- Greater accuracy;
- Transparency;
- Security in record keeping;
- Faster transfer of ownership;
- P2P interactions.

— Distributed Ledger Technology —

- Consensus mechanism:

- The process by which the computer entities (or nodes) in a network *agree on a common state of the ledger*.
- Consensus generally involves two steps: *transaction validation and agreement on ledger update by network parties*.
- Enable the creation of records that are considered *immutable, or unchangeable*, yet they are transparent and accessible to network participants on a near-real-time basis.

— Proof of Work vs. Proof of Stake —

- Consensus Protocol

- Fundamentally, blockchains are software protocols that enable many parties to interact under common assumptions and knowledge without having to trust each other.
- How blocks are chained together is determined by the consensus protocol, a set of rules governing how blocks can join the chain and become the immutable "truth."

———— Proof of Work vs. Proof of Stake ——

● Proof of Work (PoW)

- Used to verify a transaction involves a cryptographic problem that must be solved by some computers on the network each time a transaction takes place.
- Miners use powerful computers and significant amounts of energy to solve complex algorithm puzzles to validate and lock blocks of transactions into the blockchain, earning cryptocurrency for themselves in the process.
- To manipulate historical data, an individual or entity would have to control most nodes in the network.
 - ✓ 51% attack threshold.

———— Proof of Work vs. Proof of Stake ——

● Proof of Stake (PoS)

- Requires selected participants on the networks, the validators, to pledge capital to vouch for the block's validity.
- Validators benefit from both proposing and attesting to the validity of blocks that have been proposed by other participants in a similar staking process.
- Successful miners that validate the transaction obtain a new digital asset, whether it is a cryptocurrency or a token.

— Permissioned and Permissionless Networks —

	Permissioned blockchain	Permissionless blockchain
Speed	Faster as only a limited number of members participate or are authorized to validate transactions	Slower as a large number of members have to reach consensus, which decreases network speed and scalability
Cost	Cost-effective as few members are required to validate each transaction	Not cost-effective as many members are required to validate each transaction
Decentralization	Partially decentralized as there are a limited number of members in the chain	Decentralized as all members can access the network
Access	Membership is limited	Membership is unlimited
Governance	The governance is determined by a centralized organization	The governance is decentralized and is maintained by the members

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Summary

Distributed Ledger Technology

Distributed Ledger Technology

Blockchain

Consensus Protocol: Proof of Work & Proof of Stake

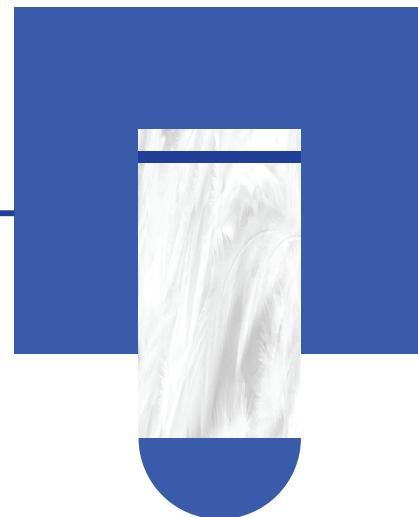
Proof of Work vs. Proof of Stake

Permissioned and Permissionless Networks

Types of Digital Assets

Digital Asset Investment Features

- explain investment features of digital assets and contrast them with other asset classes



• Distinguishing Characteristics of Digital Assets •

- The main differences between digital assets and traditional financial assets are as follows:

	Digital Assets	Traditional Financial Assets
Inherent value	<ul style="list-style-type: none">□ No fundamental value or future cash flow generation;□ Price driven by certain features on the blockchain.	<ul style="list-style-type: none">□ Value determined by future cash flow generated from the assets.
Transaction validation	<ul style="list-style-type: none">□ Usually recorded on decentralized digital ledgers using cryptography and algorithms for permissionless blockchain networks.	<ul style="list-style-type: none">□ Recorded in private ledgers maintained by central intermediaries.
Uses as a medium of exchange	<ul style="list-style-type: none">□ Very few digital assets are used as a direct medium of exchange, mainly targeting large-scale commercially viable acceptance.	<ul style="list-style-type: none">□ Not used directly as a medium of exchange but can be readily transacted and exchanged into traditional fiat currencies that are widely used in the real world.
Legal and regulatory protection	<ul style="list-style-type: none">□ Ambiguous, often contradictory, evolving framework; generally unregulated, with minimal legal protections;□ Use can be illegal or criminal in some countries.	<ul style="list-style-type: none">□ Well-established, tested, and proven legal, regulatory, and commercial standards that are clear, predictable, and well defined across all jurisdictions.

Summary

Digital Asset Investment Features

Distinguishing Characteristics of Digital Assets
Investible Digital Assets

Summary

Module: Introduction to Digital Assets

Distributed Ledger Technology
Digital Asset Investment Features
Digital Asset Investment Forms
Digital Asset Investment Risk, Return, and Diversification

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 - ✓ 所在班级
 - ✓ 问题所在科目(若未知科目，请提供章节、知识点和页码)
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