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CHEAT SHEET

CFA® Program Level I

Alternative Investments Cheat Sheet

2027 curriculum · 7 readings · 11 formulas

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ABOUT THIS EDITION

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The revision summary of the CredGuild notes for the 2027 CFA® Program Level I curriculum, Alternative Investments: for each reading, the bottom line of every module, the exam shortcuts and the formulas. Use it in the last weeks before the exam, after you have studied the readings.

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CFA® PROGRAM LEVEL I · CHEAT SHEET

Alternative Investments

Exam weight 6–9% · 7 readings · 11 formulas

80 Alternative Investment Features, Methods, and Structures

- Alternative investments are everything outside long-only holdings of cash and publicly traded stocks and bonds, and they fall into three broad categories: private capital, real assets and hedge funds.
- Investors add alternatives for diversification, because their returns have relatively low correlations with stocks and bonds, and for higher potential returns from an illiquidity premium and less efficient markets, although correlations that are low on average can rise sharply under economic stress.
- Compared with traditional investments, alternatives have more specialized managers, less liquid assets, longer horizons, larger commitments, less regulation and transparency, higher fees and scarce, less reliable return data.
- Fund investing gives the broadest diversification with the lowest amounts and leaves due diligence to the manager, co-investing lowers fees overall by putting part of the money directly into deals alongside the manager, and direct investing gives full control with no outside-manager fees but the least diversification and the highest size and expertise requirements.
- In a limited partnership the GP makes all investment decisions and bears the partnership's liabilities, while LPs own shares in proportion to their contributions, typically have no say in management and no liability beyond their investment.
- The management fee, typically 1%–2% a year regardless of performance, is charged on AUM for hedge funds and on committed capital for private equity funds.
- The performance fee is paid only once a hurdle rate is met, on the whole gain under a soft hurdle and only on the gain above the hurdle under a hard hurdle, and a high-water mark bars fees on gains that merely recover earlier losses.
- A deal-by-deal (American) waterfall and a catch-up clause favor the GP, a whole-of-fund (European) waterfall, a high-water mark and a clawback favor the LPs, and a clawback is most valuable with a deal-by-deal waterfall.

FORMULAS

Calculating the performance fee

$$\text{Fee}_{\text{soft hurdle}} = p \times R$$

$$\text{Fee}_{\text{hard hurdle}} = p \times (R - h)$$

$$\text{full catch-up reached at } R = \frac{h}{1 - p}$$

81 Alternative Investment Performance and Returns

- Over a fund's life returns are negative in the capital commitment phase, still negative but improving in the deployment phase and positive in the distribution phase, the J-curve, which makes the IRR the most appropriate measure, while MOIC ignores timing.

- The leveraged return is $r + (V_B/V_0)(r - r_B)$, so borrowing adds return when the portfolio earns more than the borrowing rate and deepens losses when it earns less, and margin calls can force sales at bad prices.
- Level 3 values rest on unobservable inputs and change little, which smooths reported returns so risk and correlation with traditional investments look lower than they are; exam convention: stale values can also make returns look higher; current practice: staleness by itself only smooths, and the direction of any effect on the average return is not fixed.
- Lockup periods, notice periods, redemption fees and gates restrict redemptions, and under either-or fees the investor pays the greater of the management fee and the incentive fee each year.
- Survivorship bias, especially large for hedge funds, overstates index returns and understates risk, backfill bias may magnify it, and comparing funds of the same vintage year deals with differences in life-cycle stage.
- An after-fee return requires the stated asset base for the management fee, whether the performance fee is net of or independent of the management fee, the type of hurdle and any high-water mark, none of which should be assumed.
- An investor in a fund of funds pays the underlying funds' fees, already reflected in their net values, plus the fund of funds' own fees on top.
- Under a deal-by-deal (American) waterfall the GP earns a fee on each profitable exit even if other deals lose money, a whole-of-fund (European) waterfall bases the fee on the net gain across all deals, and a clawback lets LPs recover the excess.

EXAM SHORTCUTS

- Delaying distributions without changing their amounts leaves MOIC unchanged but lowers the IRR, so when only timing changes, MOIC can be ruled out as the measure that reflects it.

FORMULAS

Life cycle and the J-curve	$\text{MOIC} = \dfrac{\text{total capital returned} + \text{value of remaining assets}}{\text{total capital paid in}}$
Leverage	$\text{leveraged return} = \dfrac{r(V_0 + V_B) - r_B V_B}{V_0}$ $\text{leveraged return} = r + \dfrac{V_B}{V_0}(r - r_B)$
After-fee return mechanics	$\text{total fees} = mV_1 + \max\left[0,\ p(V_1 - V_0)\right]$ $r_{\text{after fees}} = \dfrac{V_1 - V_0 - \text{total fees}}{V_0}$

82 Investments in Private Capital: Equity and Debt

- An LBO fund buys a public company largely with debt and takes it private; an MBO keeps the existing management and an MBI brings in a new team.
- Venture capital runs from pre-seed (angel) and seed capital, the first round with VC funds, through early-stage and later-stage financing to mezzanine-stage financing before an IPO.
- Exit routes are a trade sale, an IPO, a direct listing, a SPAC, a secondary sale and a write-off; a recapitalization extracts cash but is not a true exit.
- A PIPE is a private sale of a listed company's shares, and the company stays listed.
- Among private debt types, direct lending carries the lowest risk, unitranche debt moderate risk, and mezzanine, venture and distressed debt high risk.
- Private equity indexes overstate returns through survivorship and backfill bias, and infrequent valuation understates volatility and correlation.

- A fund's vintage year is the year of its first investment, and investors should diversify across vintage years.

EXAM SHORTCUTS

- Place a VC round by whether sales have begun: formative stages come before production and sales, later-stage capital comes after, and mezzanine-stage financing prepares for an IPO.

83 Real Estate and Infrastructure

MODULE 83.1 · REAL ESTATE

- Real estate investments are classified as public or private and as debt or equity; an equity investor owns the property and controls borrowing, management and exit decisions, while a debt investor's claim is secured by the property and ranks ahead of equity in default.
- Direct real estate gives control, diversification and tax benefits, but brings illiquidity, price opacity, management complexity, a need for specialized market knowledge, high initial capital and concentration risk.
- Exam convention: exchange-traded REITs face no redemption or liquidation risk, because investors exit by selling shares; current practice: a REIT keeps its tax exemption only if it distributes most of its taxable income, and non-traded REITs exist whose redemption programs may be limited or suspended.
- Equity real estate strategies run from least to most risky as core (high-quality property, stable income, open-end), core-plus, value-add and opportunistic (closed-end, finite life).
- The more a holding relies on steady lease income the more it behaves like a bond, and the more it relies on development or rising prices the more it behaves like equity, with first mortgages and investment-grade CMBS the least risky.
- Publicly traded REITs offer diversification and liquidity but are more correlated with equities than direct real estate, with the correlation rising in steep downturns, although adding real estate still improves a stock-and-bond portfolio's risk-return profile.

MODULE 83.2 · INFRASTRUCTURE

- Economic infrastructure covers transportation, utilities and energy (including waste disposal and treatment) and information and communication technology (including telecom towers), while social infrastructure covers prisons, schools and health care facilities.
- Infrastructure revenue comes from availability payments made regardless of use, usage-based payments such as tolls, or take-or-pay arrangements with a minimum price for an agreed volume, and the projects carrying the most risk are usually those whose revenue depends on demand that is still uncertain.
- A greenfield investment is an asset still to be constructed, typically under build-operate-transfer; a brownfield investment expands or privatizes an existing asset, for example through a sale-leaseback; and a secondary-stage investment is a fully operational brownfield asset needing no further development.
- Secondary-stage and brownfield assets have stable cash flows, a relatively high current yield, little growth potential and lower risk and return, with secondary-stage assets the least risky, while greenfield assets have uncertain cash flows, more growth potential and higher risk and expected return.
- Direct infrastructure investment is illiquid because the assets are huge and long-lived, and MLPs, ETFs, mutual funds and private equity funds offer indirect exposure with more liquidity.
- Infrastructure risks include regulatory risk, financial leverage, cash flows below expectations, construction risk and operational risk, and the assets suit long-term institutions such as pension plans, life insurers and sovereign wealth funds.

84 Natural Resources

- Raw land, farmland and timberland are illiquid and valued mainly by location; raw land produces little or no current cash flow, farmland has the steadiest income, and timberland lets the owner choose when to harvest, whereas farm crops must be harvested within a short window.

- Derivatives are the most common route to commodity exposure, and exchange-traded futures carry no counterparty risk because the clearinghouse guarantees performance.
- Exam convention: commodity ETPs, both ETFs and ETNs, suit investors limited to buying equity shares; current practice: an ETN is an unsecured debt note carrying issuer credit risk, so an equity-only mandate would normally have to allow debt before holding one.
- The futures price is approximately spot × $(1 + r_f)$ + storage costs − convenience yield, the convenience yield being the nonmonetary benefit of holding the physical good, which lowers the futures price.
- A positive net cost of carry puts futures above spot (contango) and lowers long-only returns, while a negative net cost of carry puts futures below spot (backwardation) and raises them.
- Commodity supply is inelastic in the short run, so prices can swing sharply over the economic cycle or after supply shocks such as natural disasters.
- In recent decades commodities have had higher returns and higher volatility than global stocks or bonds, while timberland and farmland have had higher average returns with volatility below global stocks and similar to global bonds.
- Commodities have historically offered diversification through low correlation with global equities and bonds and an inflation hedge because their prices tend to move with inflation, but holding them produces no current income.

EXAM SHORTCUTS

- When storage costs equal the convenience yield they cancel, so with a positive risk-free rate the futures price exceeds the spot price by the financing cost alone and the market is in contango.

FORMULAS

Commodity valuation: cost of carry	$\text{futures price} \approx \text{spot price} \times (1 + r_f) + \text{storage costs} - \text{convenience yield}$

85 Hedge Funds

- A hedge fund is a privately offered pool open to investors above a wealth or sophistication threshold, lightly regulated and free to use long and short positions, leverage and derivatives, and it is usually evaluated on an absolute or risk-adjusted basis instead of against a conventional benchmark.
- Compared with private equity, hedge funds hold more liquid assets, have a shorter horizon and allow periodic redemptions, and they charge the management fee on assets under management where private equity charges it on committed capital.
- The four strategy families are equity hedge (including market neutral), event-driven (including merger arbitrage, long the target and short the acquirer), relative value (including convertible arbitrage) and opportunistic (macro and managed futures).
- During a lockup period the investor cannot redeem (hard lockup) or can redeem only with a significant penalty (soft lockup), a notice period is the time the fund has to pay out a redemption, a gate partially limits redemptions, and a high-water mark restricts the incentive fee to value above the fund's previous peak.
- A separately managed account is tailored to one investor and often has lower fees but needs more oversight and aligns interests less closely, while a fund of funds offers diversification and access for smaller investors at the cost of a second layer of fees.
- Hedge fund returns come from market beta, strategy beta and alpha; funds often short away market beta because it is cheap to buy through index funds, and they use leverage to magnify strategy beta and alpha.
- The coefficient of variation, $\sigma / \bar{R}$, measures risk per unit of return, and a lower CV means better risk-adjusted performance, whereas a low standard deviation or a high return alone ignores the other side.
- Because index data are reported voluntarily, survivorship and backfill bias both overstate hedge fund index returns, and selection bias distorts category comparisons.

FORMULAS

Where returns come from, index biases and diversification

$$R_{\text{fund}} = \underbrace{\text{market beta}}_{\text{broad market}} + \underbrace{\text{strategy beta}}_{\text{sector/strategy exposure}} + \underbrace{\alpha}_{\text{manager skill}}$$

$$CV = \frac{\sigma}{\bar{R}}$$

86 Introduction to Digital Assets

MODULE 86.1 · DISTRIBUTED LEDGER TECHNOLOGY

- Digital assets are created, stored and transferred electronically and secured with distributed ledger technology; a cryptocurrency runs on its own blockchain, while a crypto token is built on an existing one.
- The three parts of a DLT network are the digital ledger, the consensus mechanism and the network of participants, and validating and then updating the ledger makes its records immutable while keeping them visible to all participants.
- Under proof of work, miners solve a cryptographic problem and an attack would need most of the network's computing power; under proof of stake, validators pledge collateral, and the exam convention says validators guard the network by controlling most of its computational power, while in current practice an attacker would need most of the stake.
- A permissionless network is open to every user with all transactions visible and no need for parties to trust one another, while a permissioned network restricts some users' activities and is more cost effective.
- Stablecoins hold their value by being linked to another asset through reserves or, for algorithmic stablecoins, supply adjustments; exam convention: they cannot be converted into fiat currency and have no legal or regulatory backing; current practice: some issuers redeem them for fiat and some jurisdictions regulate issuers.
- Tokenization records ownership of physical assets on DLT, an NFT represents a distinct item, ICO buyers usually receive crypto tokens with no voting rights in an unregulated offering, utility tokens pay for network services, and governance tokens give voting rights over the network.

MODULE 86.2 · DIGITAL ASSET CHARACTERISTICS

- Unlike traditional financial assets, most digital assets have no backing and generate no cash flows, so they have no fundamental value; they are recorded on decentralized ledgers, are not legal tender in many jurisdictions and lack well-developed regulatory standards.
- Centralized crypto exchanges are the most popular type but more vulnerable to attack, while decentralized exchanges keep running if one computer is hit and are difficult to regulate.
- Direct investment carries the risks of fraud, permanent loss of coins whose passkey is lost, and, in thinly held coins, price manipulation by whales.
- Indirect exposure comes from coin trusts, which hold the coins and trade over the counter, cash-settled and leveraged futures, exchange-traded products (exam convention: typically not holding the coins; current practice: some spot ETPs launched since 2024 do), crypto stocks and crypto hedge funds.
- Asset-backed tokens are digital claims collateralized by nondigital assets, which allow fractional ownership, create an immutable ownership record that improves transparency and lowers transaction costs, and are generally classified by regulators as securities.
- Cryptocurrency returns come mainly from price appreciation, with limited supply a major driver, and have been high but highly volatile; their historically low correlations with traditional assets may offer diversification, although correlations can rise in periods of extreme stress.

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