2026

CAIA®

Exam Prep

Schweser's Secret Sauce®

Level I

KAPLAN SCHWESER

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SCHWESER'S SECRET SAUCE®: 2026 CAIA® Level I

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ABOUT THIS REVIEW GUIDE

Schweser's Secret Sauce® is intended to serve as a focused and practical companion after your initial studies. This concise book distills the most critical concepts, definitions, and exam strategies from the extensive CAIA Level I curriculum. It is designed for efficient review, portability, and quick reference during the final phase of exam preparation.

It is important to emphasize, however, that not every learning objective in the curriculum is addressed in detail. To build a comprehensive understanding, we strongly encourage you to utilize this guide as a review of the material from the SchweserNotes™, the official CAIA curriculum, and additional practice resources. Repetition and consistent review are important components of successful mastery on exam day.

Earning the CAIA designation is a significant undertaking. The breadth and depth of the material require diligence, discipline, and perseverance. There are no shortcuts to genuine understanding of the material. Your preparation should be thorough and systematic, making full use of the suite of study tools available to you, including the SchweserNotes™, OnDemand Classes, SchweserPro™ QBank, and Mock Exams.

By pursuing the CAIA credential, you are joining a distinguished global community of investment professionals dedicated to advancing the practice and principles of alternative investments. Whether you are seeking career advancement, a transition to a new role, or an enhancement of your investment acumen, the knowledge and skills you acquire in this program will serve you well throughout your professional journey.

On behalf of the entire Kaplan Schweser team, we thank you for selecting us as your educational partner. We extend our best wishes for your studies and look forward to your future achievements as a CAIA charterholder.

CAIA ETHICAL PRINCIPLES

Readings 1.1–1.2

Weight on Exam	8%–12%
SchweserNotes™ Reference	Book 1, Pages 1–35

Ethics comprises 10% of the CAIA Level I exam and plays a critical role in your overall success. Questions in this section can be subtle and detail-oriented, requiring a thorough and thoughtful approach. Begin your preparation for Ethics early, and revisit the material multiple times to reinforce your understanding. Mastery of Ethics is essential for success on the exam.

READING 1.1: PROFESSIONALISM AND FIDUCIARY RESPONSIBILITIES

Investment Industry

The major participants in the investment industry are asset owners, asset managers, consultants, brokers, investment banks, service providers, and regulators. The participants interact with technologies and markets in the investment ecosystem. Technologies consider factors such as regulation and investment theory, which shape investment strategies and capital allocation. Markets refer to the securities to be transacted to generate wealth as well as the need for skilled investment professionals and service providers (e.g., traders, custodians).

The purpose of the investment industry can be broken up into four parts: (1) intrinsic, (2) core, (3) fundamental, and (4) collateral. The **intrinsic purpose** refers to simply matching savers (those with excess capital to invest) with spenders (those who need to borrow capital to achieve their objectives). There is also the **core purpose**, which is portfolio management. This involves picking the most appropriate investments that will generate optimal returns over the long term, but within the constraint of acceptable risk levels. In addition, there is the **fundamental purpose**, which is to enhance overall societal wealth and well-being. The investment industry enhances societal well-being if its activities result in greater access to capital markets for everyone. Finally, the **collateral purpose** looks to provide opportunities for employment as well as investment firm growth.

Value Creation

In the investment industry, wealth and risk management are the main forms of value creation. These activities occur most frequently during portfolio creation and portfolio management (i.e., balancing returns with investor risk tolerances over the long term). Current attention is placed on risk management at given points in time as well as relative risk (i.e.,

portfolio risk relative to an appropriate benchmark). Improvement in this area would be more focus on continuous risk management as well as absolute risk.

The value that is created by a firm must consider the individual characteristics of the firm, as noted in the firm's mission or objective. That value creation should also consider all relevant stakeholders, including society in general. The main idea behind **sustainable finance** is to satisfy asset owner current needs while not jeopardizing the interests of future stakeholders.

From a system-value perspective, the investment industry and society are integrated and must be evaluated together. Value creation is earning a required financial return (i.e., maximizing shareholder *value*) and potentially an even higher return (i.e., maximizing shareholder *welfare*). The investment industry positively impacts society by providing employment opportunities and capital.

Fiduciary Duty

Fiduciary duty attempts to hold investment professionals to high standards when performing duties on behalf of their clients. Fiduciary obligations typically cover the following four areas:

1. **Loyalty.** In the context of investment strategies, clients/beneficiaries always come first, and there should be no conflicts of interest between clients/beneficiaries and the investment professional.
2. **Prudence and care.** Perform duties with sufficient care and judgment to the level of a prudent individual.
3. **Diversification.** Achieve sufficient diversification consistent with modern portfolio theory and accepted industry practice.
4. **Impartiality.** Ensure that the investment professional does not favor any client/beneficiary over another.

One challenge to the areas of fiduciary obligations is that an exact application of each area is problematic, as there will likely be multiple valid approaches. As a result, modern portfolio theory and industry practice are often used in conjunction with each other. The definition of *fiduciary duty* naturally changes as investment theory and practice change over time. Furthermore, there is no universal definition of exactly what fiduciary duty involves (e.g., which investment personnel are subject to fiduciary duty).

In short, the four areas of fiduciary duty essentially address the concept of professionalism in the investment industry. Additionally, in the context of making investment decisions, the areas require the fiduciary to consider not only client needs, but also the overall needs of society.

A true fiduciary and professional mindset involves anticipating a long-term relationship with a client that provides value and financial rewards. Five specific values to consider within the professional mindset are as follows:

1. **Ethical and professional behavior.** Such behavior is heavily embedded in firm culture so that personnel are motivated and possibly even rewarded for behaving in an ethical and professional manner.
2. **Partnership.** The investment firm functions as a partner to the client, and the firm's employees use their professional skills to help achieve the client's investment objectives.
3. **Client first.** Knowledge of clients and their needs is an important first step, upon which investment decisions are made that are congruent with those needs.

4. **Transparency, integrity, and accountability.** These are pervasive values for professionals in general, but when interacting with stakeholders, information relayed to them should be clear, thorough, and not misleading.
5. **Public responsibility and clean license to operate.** Investment professionals must strive to achieve investment results that enhance the firm's and the industry's reputation.

Culture is often influenced by the top leaders within the group, and the leaders who demonstrate professionalism serve as role models for others within the group. Behaviors reflect a group's culture, which means all members influence the culture through their consistent professional behavior. The impact of culture is seen both in the group's past and future activities.

Client-First Mindset

In a manager-client relationship, trust is given by the client and sought by the asset manager. The client trusts that the asset manager will manage the risk and return elements of the client's investment portfolio for the client's benefit. Gaining a client's trust requires the following elements:

- **Credibility.** The asset manager is licensed and qualified to provide the service and has met all relevant regulatory requirements.
- **Communication.** The asset manager communicates with clients on a timely and thorough basis, using relevant technology where applicable.
- **Professionalism.** The asset manager has the ability to deliver the service at the appropriate skill level, together with loyalty, care, and prudence.

If making the "right choice" is not obvious, there are three general instances to consider: (1) conflicts of interest, (2) the tradeoff of benefits and costs, and (3) insufficient knowledge of the client. The investment decision should occur under a methodical and transparent application of rules and principles that embed the firm's underlying culture.

Unfortunately, there are competing incentives in the current system that often provide asset managers with higher short-term remuneration and/or enhanced reputation at the cost of not acting in the best interests of their clients (i.e., acting unprofessionally). For example, the fees paid by the client may be out of proportion to the value added.

The current state of the investment industry could arguably be classified as a **misaligned industry**, which is somewhat good for the industry but not good for society. The industry benefits from high remuneration to some players, but it is paid for by members of society. If all members of the investment industry were to use a professional mindset, it could result in a reclassification of the industry as a **professional industry**, which is good for both the industry and society.

There are three entities to consider regarding the virtuous circle of positive forces:

1. A *portfolio* benefits from managers with expertise and focus, which improves the chances of achieving performance objectives.
2. The *client* earns outstanding returns, which enhances the trust in the asset manager and leads to a stronger and more stable manager-client relationship.
3. The *asset manager* earns greater fees and incentives from the client given outstanding investment performance.

READING 1.2: ETHICS

Foundations of the CAIA Ethical Principles

Recently, there has been a shift in thinking about the investment industry as a stand-alone entity to one that is part of an **investment ecosystem**, which involves market participants, stakeholders, financial markets, motivations, theories and strategies, regulations, principles, and boundaries. This ecosystem has many purposes, which should all be motivated by common ethical factors.

It should be noted that **values** are individual beliefs and motivations, while **ethics** are a collective understanding of what is right and wrong. Ethics is a moral compass that can be used to find the right path in any landscape. Ethical factors in an investment context include honesty, fairness, diligence, and mutual respect. Self-interest should be minimized wherever possible.

The **value creation equation** illustrates that combining purpose, professionalism, and assurance will generate value (for clients). A sense of purpose (e.g., vision and goals) is what gives professionalism direction. Only when a purpose is identified should strategies be deployed. In this context, strategy includes the business model, investment model, people model, and change model, all linked by the system model. Assurance methods (e.g., fiduciary duty and trust) connect professionalism with organization and client outcomes.

Assurance of quality defines the critical professional standards necessary for the provider-client relationship to thrive. The four parts of assurance are (1) fiduciary duty, (2) license to operate, (3) trust, and (4) managing conflicts of interest. These elements will evolve over time as markets, products, and needs change.

Fiduciary duty is a legal requirement that those who manage money for others must behave in the best interests of the beneficiary/client rather than their own best interests.

License to operate refers to the legitimacy and social acceptance that an investment manager needs to attain from stakeholders to function effectively.

In an investment context, **trust** is confidence extended between an end user and a service provider. It is enhanced by both personal and organizational reputation, but it is built slowly and can be destroyed quickly.

A **conflict of interest** can arise when one party's interests compromise their prudent judgment when making a decision. The fiduciary standard requires providers to act in their clients' best interest at all times.

Ethical Principles for Investment Professionals

The eight CAIA Ethical Principles assist investment professionals with an understanding of how they should behave. These principles set the tone for an ethical standard of care that exceeds the minimum standards imposed by rules and regulations.

Principles 1 through 4 can be categorized as "doing the right things," while Principles 5 through 8 can be categorized as "doing things right." *Doing the right things* refers to ethical intent and values; *doing things right* refers to execution competence.

Principle 1: Ethical and Professional Behavior

Principle 1 encourages the company and its professionals to create a culture that prioritizes, respects, and promotes ethical and professional behavior. An ethical and professional approach acknowledges the broader impact of investment decisions. Thus, it aims to produce results that benefit the company while also demonstrating consideration for all stakeholders, including society. It is important to prioritize clients, but not at the expense of other stakeholders. A key focus is the company's approach to managing externalities such as sustainability, human rights, inclusivity, and human capital within its various businesses and portfolios.

Principle 2: Partnership

Principle 2 encourages collaboration among the company, its professionals, and clients through peer-to-peer partnerships. The company must view its specialized skills as essential to client success, and not as a competitive edge over clients. Successful partnerships depend on mutual trust, empathy, strong relationships, open communication about expectations, and effective conflict resolution.

Principle 3: Client-First Mindset

Principle 3 encourages a client-first mindset that prioritizes knowing the clients, understanding their needs (Principle 2), and acting accordingly. The focus here is on dedicated client commitment and purpose-driven actions. Both aspects contribute to better alignment and increased trust.

Principle 4: High Standards of Conduct: Transparency, Integrity, and Accountability

Principle 4 encourages the company and its professionals to conduct all activities with high standards of conduct. Thus, all communications with clients, employees, colleagues, investees, regulators, and other stakeholders are required to be transparent, accurate, and authentic.

Principle 5: High Standards of Practice

Principle 5 encourages high standards of practice. This involves having expert investment skills, demonstrating rigorous, evidence-based thinking that is aligned with industry standards, and conducting ongoing reviews of best practices across all responsibilities.

Principle 6: Professional Work

Principle 6 encourages high-quality professional work, which involves extensive research and due diligence, a broad scope of thinking, and ongoing client interaction. Managing risk should be a core professional competency. This encompasses a comprehensive understanding of how interconnected factors influence risks and outcomes.

Principle 7: Continued Learning

Principle 7 encourages continuous learning, which enhances an individual's ability to adapt to new information and changing situations. This commitment to ongoing personal and professional growth involves self-learning and self-improvement.

Principle 8: Collaboration

Principle 8 encourages collaboration among investors inside the firm and throughout the finance industry in an effort to enhance value. The accuracy and insightful nature of client

advice and communications benefit from peer review, diverse perspectives, critical thinking, and differing viewpoints.

Principles-Based Approach

A **principles-based approach** promotes an ethical standard of care that exceeds that required by rules and regulations. It models a global view that enables flexibility and case-by-case treatment. Using principles allows the investment industry to evolve as markets and conditions change. They lay the foundation for professionals to balance wealth management and risk management for clients while also promoting an affordable, secure, and sustainable investment ecosystem.

Examples of Ethical Misconduct in the Finance Industry

This section reviews five significant ethical breaches that have occurred over the last several decades. These examples involve both general partners and limited partners, and demonstrate that ethical breaches are not limited to trading in the financial markets. A common theme across all five cases is inadequate checks and balances.

MF Global. This firm was a commodities broker that made substantial bets on illiquid fixed-income investments. The market did not move the way they forecasted, and its unhedged losses became large. MF Global moved client assets into the firm's account to meet margin calls, which resulted in significant regulatory violations as well as capital losses. There were multiple associated failures in governance.

Archegos Capital Management. This family office escaped regulation requirements due to how it was structured. They amassed significant positions using leverage, and their counterparties were not aware of the firm's aggregate risk exposure. Their holdings moved in the wrong direction, and as a result, margin calls ensued. Massive losses for the counterparties resulted, along with a guilty plea by the firm's founder.

Bear Stearns. This Wall Street firm heavily invested in MBSs and CDOs at the wrong time. The Great Financial Crisis (GFC) began in 2007, and losses mounted. The firm told investors that losses were better than reality. Portfolio managers told investors they were adding personal investments when they were actually selling and shorting what the fund invested in. To avoid bankruptcy, the firm was sold to JPMorgan in 2008.

New York State Common Retirement Fund. The New York State comptroller was accepting bribes and political contributions from a placement agent to direct fund investment in a way that was inconsistent with sound due diligence. Jail time and regulation both resulted for the main participants.

CalPERS. The CEO of the California Public Employees' Retirement System (CalPERS) accepted bribes from a placement agent to direct investment dollars to certain PE investments. There were governance failures and massive conflicts of interest involved.

INTRODUCTION TO ALTERNATIVE INVESTMENTS

Readings 2.1–2.8

Weight on Exam	20%–28%
SchweserNotes™ Reference	Book 1, Pages 37–294

Topic 2 provides an introduction to alternative investments and establishes a framework for their analysis using statistical methods. While many of the techniques discussed are also utilized in traditional investment analysis, they are adapted here to address the unique characteristics and challenges of alternative assets. This topic area covers a wide range of important definitions and formulas, so you should be prepared for quantitative problem-solving and analytical calculations on the exam.

READING 2.1: WHAT IS AN ALTERNATIVE INVESTMENT?

Categories of Alternative Investments

Traditional investments are long positions in cash, bonds, and publicly traded stocks. Alternative investments are considered nontraditional.

There are four categories of alternative assets you must know for the CAIA exam, including real assets, hedge funds, private equity, and private debt:

1. **Real assets** are associated with investments that directly control nonfinancial assets and represent actual rights to consumption. Real asset investments include real estate, infrastructure, natural resources, commodities, and intangible assets.
2. **Hedge funds** are private investment vehicles that are subject to minimal regulation and therefore able to pursue unique investment opportunities using derivatives, leverage, short positions, and other strategies.
3. **Private equity** includes equity securities that are not publicly traded. Private equity investments include venture capital, growth equity, and leveraged buyouts (LBOs).
4. **Private debt** was commonly considered part of private equity. This was because debt investments in highly leveraged firms generally behave like equity investments due to high cash flow risk. Private debt investments include direct lending strategies, distressed debt, and structured products.

Return Characteristics

Alternative investments are often viewed as diversifiers because they frequently have low or no correlation with traditional assets, allowing investors to reduce risk without hurting return expectations. Alternative investments also tend to be illiquid (infrequent or low-volume trading) and lumpy (difficult to divide), meaning that immediate transactions occur at lower

prices than for an equivalent liquid asset. Many alternative investments trade at inefficient prices due to fewer participants, lower competition, higher transaction costs, and an inability to establish both long and short positions. Finally, the return distributions for many alternative investments are not normal due to infrequent trading, nonlinear payoffs, and leverage.

Alternative Investing Goals

The primary goals associated with investing in alternative assets include active management, absolute and relative return generation, arbitrage, return enhancement, and return diversification.

Alternative investment managers are evaluated in terms of active management systems, which incur active risk (deviation from the benchmark) to obtain active return (average portfolio return above the benchmark). Managers may generate absolute returns (evaluated against a standard of zero or the risk-free rate) or relative returns (evaluated against a risky benchmark return) by engaging in arbitrage, return enhancement, or return diversification strategies.

Market Participants

Buy-side institutions are asset managers that focus on acquiring appropriate securities for their investment portfolios.

- **Plan sponsors** are organizations that fund a health care or retirement plan for qualified members. The plan sponsor manages the plan assets to meet its obligations and determines the membership requirements and plan structure.
- With **foundations and endowments**, *foundations* are nonprofit funds established to support specific charitable activities on a continuing basis while maintaining the real value of the portfolio assets. *Endowments* are funds dedicated to providing financial support on an ongoing basis for a specific purpose. Foundations and endowments typically have long investment horizons, high risk tolerance, and low liquidity needs.
- **Family offices** and **private wealth institutions** are investment firms whose client base consists of high net worth families.
- **Sovereign wealth funds** are pools of assets owned by a government and typically managed by its central bank. Their purpose is to stabilize the economy, to provide a potential resource for future crises, and to provide future goods and services to citizens.
- **Private investment pools** include hedge funds, funds of funds, private equity funds, and commodity trading advisers. These funds are typically structured as limited partnerships and use sophisticated trading strategies. Performance-based fees are used to reward top-performing general partners.
- A **separately managed account (SMA)** is a portfolio owned by a single investor and managed according to that investor's preferences. No shares are issued because a single investor owns the entire account.
- **Mutual funds** and **'40 Act funds**. These funds fall under the scope of the Investment Company Act of 1940 ('40 Act). A recent innovation in this category is *alternative '40 Act funds*, which use alternative investments and alternative investment strategies within the confines of the '40 Act.
- The **Undertakings for Collective Investment in Transferable Securities (UCITS)** are regulated public funds in the European Union, similar to *'40 Act funds*.

- **Private limited partnerships** operate similarly to other limited partnership structures. Limited partners experience favorable tax treatment.
- **Master limited partnerships (MLPs)** are essentially the same as a private limited partnership, but offer the advantage of being publicly traded.

Sell-side institutions focus on selling investment research and transaction execution services rather than managing accounts.

- **Large dealer banks** underwrite and trade securities and derivatives; often operate their own hedge funds and private equity funds; and engage in proprietary trading, off-balance sheet financing, and over-the-counter derivatives trading. Dealer banks also may offer account management services to buy-side institutions and may serve as prime brokers. Large dealer banks have the potential to influence the overall health of the financial markets because of actions that can increase systemic risk.
- **Retail brokers** generate investment research and execute securities trades for their customers. Retail brokers also engage in proprietary trading. Front office responsibilities include client meetings to decide investment strategies. Middle office responsibilities include managing risk and linking front and back office communication. Back office responsibilities include account maintenance, information technology, and clearing and settling trades.

Outside service providers provide professional services vital to the formation and continued operation of alternative investment funds.

- **Prime brokers** execute trades on behalf of investment managers; lend securities to sell short; and provide research, account statements, other documentation, and financing. Prime brokers allow managers to transact with multiple broker-dealers and in multiple investment types within a single account.
- **Auditors/accountants** review all documentation for accounting issues and provide tax advice to managers creating funds. The accountant audits fund records, provides tax and compensation advice, and prepares financial statements once the fund is operational.
- **Attorneys** provide legal advice regarding optimal fund structure; maintain regulatory registrations; and prepare documents including private placement memorandums, offering documents, partnership agreements, subscription agreements, and management company operating agreements.
- **Fund administrators** verify operational controls, assets under management, and performance figures, and may also be a key figure regarding tax issues and audit preparation.
- **Hedge fund infrastructure** service providers reduce the complexity of operating a hedge fund by providing platforms, software, and data.
- **Consultants** provide portfolio allocation and investment manager selection advice. They may also help identify client investment objectives and provide ongoing monitoring of portfolios and managers. The challenge with consultants is the potential for consulting conflicts of interest, where the objectivity of consultants may be compromised when they are paid by money managers.
- **Depositories/custodians** hold client assets and provide information services, trade clearance, and trade settlement.
- **Banks** include *investment banks* that focus on investment activities, while *commercial banks* focus on capital management and provide loans, lines of credit, and external credit

enhancement. Non-U.S. banks may be structured differently and provide a different set of services.

READING 2.2: ALTERNATIVE INVESTMENT FUNDS AND TERMS

Alternative Investment Legal Structures

Common structures of alternative investments include the following:

- **Limited liability** represents an upper limit on an investor's potential losses. Limited liability comes from holding passive investments, where the owner has the benefit of reduced liability due to having a small stake in and relatively limited control or influence on the business. The asymmetry between limited losses and large potential profits raises the issue of probity (exercising strong moral principles).
- **Limited liability companies (LLCs)** are legal entities that offer protection to their investors in a manner similar to corporations, with two differences relative to corporation investors: (1) protection is not absolute, and (2) distributions are not necessarily pro rata and aligned with ownership percentages.
- **Special purpose vehicles (SPVs)** and **special purpose entities (SPEs)** are legal entities designed to be bankruptcy remote (offer protection from any bankruptcy proceedings involving the entity which set up the SPV/SPE).
- **Master trust and feeder funds** (together, a **master-feeder structure**) provide tax neutrality by accommodating the various taxation profiles associated with investors from different countries.

Alternative Investment Fund Structures

Alternative investments can be purchased using different fund structures. The universe of fund structures is often segmented by strategies that involve either public (liquid) or private (illiquid) securities.

Hedge funds that invest in strategies involving public/liquid securities typically use an **open-end fund structure**. Investors can subscribe to or redeem from open-end (evergreen) funds at any time. In the event that the fund's value declines after an incentive fee is calculated, existing investors will not be charged another incentive fee until the fund's value rises above the last incentive fee level. This is known as the **high-water mark**.

Fund structures that invest in private/illiquid securities are known as **closed-end funds**, **drawdown funds**, or **private equity (PE)-style funds**. Most of the alternative investment industry (outside of hedge funds) uses this fund structure. This structure is best suited for illiquid markets where large funds cannot be invested immediately. With PE-style funds, limited partners (LPs) pool resources to invest in privately owned companies that are managed by general partners (GPs).

The risks of a PE fund must be evaluated differently than listed investments. The key risks include market risk, liquidity risk, commitment risk, and realization risk.

- **Market risk** reflects the risk that unrealized (paper) losses in a fund become actual realized losses if the fund does not have sufficient time or capital to wait for the asset prices to recover.

- **Liquidity risk** relates to the inability to sell assets quickly and without significant losses. It can be mitigated by maintaining sufficient quantities of *liquid assets*.
- **Funding (commitment) risk** is the risk that an LP is unable to meet capital commitments, and is mitigated by the capital in *capital calls*.
- **Realization risk** is the risk of long-term losses in invested capital, and can be mitigated through sufficient *portfolio diversification*.

Key Features of Fund Structures

Key features commonly found in fund structures include the following:

- **Partnership documents** standard to the limited partnership structure include the offering memorandum/private placement memoranda; the partnership/limited partnership agreement (LPA), which sets the terms and conditions associated with the legal framework of the partnership; the subscription agreement; and the management company operating agreement.
- **Adverse selection** (decisions made by one party leading less desirable parties to be drawn into the transaction) and **moral hazards** (actions may change after a transaction is completed) are two concerns in limited partnerships.
- A **limited partner advisory committee (LPAC)** allows limited partners to have some (nonsignificant) influence. A simple majority (over 50%) is needed for smaller decisions, and a **qualified majority** (over 75%) is needed for larger-impact decisions.

Private Fund Terms

Standard private fund terms include GP contributions, known as **hurt money**, which are typically 1% of the fund's committed capital. Also, the **key personnel clause** protects LPs in case a key person leaves, cannot commit adequate time to fund management, or sells their interests. LPs can suspend investment or disinvestment activities until replacements are found. Regarding termination clauses, a **bad-leaver clause** allows for the removal of a GP for cause, while a **good-leaver clause** allows investors with a qualified majority to stop any additional funding of the partnership.

PE-style fund partnership agreements go beyond outlining funding and operations by also imposing a range of covenants designed to align interests and manage risk. These covenants typically include limits on investment concentration and leverage to reduce risk, restrictions on GP co-investments across different funds, and rules around profit distribution timing. They also cover GP behavior, prohibiting personal investments in portfolio companies and secondary sales of fund interests. Time commitment covenants ensure GPs stay focused on managing the current fund, while specialization clauses prevent them from straying into unfamiliar strategies.

PE-Style Fund Fees

PE-style fund managers earn **management fees** based on fund size, not performance. These fees, which cover operational costs (e.g., salaries, administration), typically range from 1.5% of committed capital for large funds to 2.5% for smaller ones. During the investment period, fees are charged on committed capital; afterward, they are based on invested capital. GPs may collect various fees from portfolio companies, such as monitoring, transaction, restructuring, and advisory fees. LPs typically prefer that these fees serve as **management fee offsets** to reduce their payments to GPs.

The primary incentive for GPs is **carried interest**, which provides a share of fund profits beyond management fees. Carried interest is also known as an **incentive fee** or a **performance-based fee**. Carried interest is typically 20% of profits after LPs recover their capital and any hurdle rate. It is calculated either across the entire fund (i.e., **fund-as-a-whole carried interest**) or per investment (i.e., **deal-by-deal carried interest**).

Limited partnerships include distribution **waterfall** provisions, which govern how fund profits are shared between GPs and LPs. These provisions detail the priority and sequence of payouts and typically ensure that LPs are paid before GPs. It is important for LPs to understand the waterfall structure, because it impacts both returns and GP incentives, which influence fund performance.

A **hurdle rate** (i.e., **preferred return**) is the minimum return that LPs must receive before the GP can earn incentive fees. It ensures LPs are prioritized in profit distributions until this threshold is met. The GP will only receive carried interest after the hurdle is exceeded and LPs are repaid their initial capital.

A **hard hurdle rate** restricts incentive fees to profits that surpass them, while a **soft hurdle rate** enables the GP to earn incentive fees for all profits assuming the hurdle rate is achieved. Soft hurdle rates are standard in the industry and generally what investors call the preferred return.

After a fund surpasses its hurdle rate, a **catch-up provision** allows the GP to quickly receive incentive fees, often on all profits (not just those above the hurdle rate). The **catch-up rate** specifies the percentage of profits allocated to the GP to make up for earlier shortfalls.

A **clawback** provision protects LPs by requiring GPs to return excess incentive fees if the fund underperforms over time. If the GP earns more than their agreed upon profit share, such as after strong early returns followed by losses, a clawback ensures LPs are reimbursed until their capital, expenses, and preferred return are fully recovered. To ensure compliance, many funds implement a **clawback escrow agreement**, which holds a portion of carried interest in a separate account.

Vesting gradually grants full ownership of rights, such as incentive fees. Vesting aligns incentives and can follow various schedules. Clawbacks are effectively the opposite of vesting, as they require repayment of previously received fees if specific financial thresholds are not met.

Hedge Fund Fees

Hedge fund **management fees** range from 1% to 3% and are collected on a quarterly, semiannual, or annual basis regardless of fund performance. Hedge fund **performance fees** (also known as **incentive fees**) range from 10% to 40% and are collected on an annual basis, but only if the fund is profitable and the high watermark and hurdle rate have both been surpassed.

The following formula determines the amount of hedge fund management fees earned by the general partner:

$$\text{annual fee} = \text{mgt fee \%} (NAV_{beg}) + \{\max [0, (\text{incentive fee \%}) \times (GR - \text{mgt fee} - \text{hurdle})]\}$$

where:

NAV_{beg} = NAV at the beginning of the year

GR = gross return above HWM

The **high-water mark (HWM)** is the highest NAV that incentive fees were based on for the fund. The HWM is designed to ensure incentive fees are paid only once on each dollar of cumulative net profit to the fund. Fund compensation agreements may also contain a **hurdle rate**, where the incentive fee will only be paid if the fund return exceeds a set threshold return.

Unfortunately, hedge fund performance fees may result in **perverse incentives** (i.e., managers acting in their own self-interest rather than in the interest of the fund's investors). **Optimal contracting** refers to properly designing the incentive structure so that the interests of managers and investors are aligned. One type of optimal contracting is **managerial co-investing**, where managers are required to invest in their funds. However, this may lead to **excess conservatism** regarding optimal risk levels.

To counter the incentive to take excessive risks after a major loss, a fund may use a **modified HWM**. The modified HWM structure reduces the incentive fee on profits made below the HWM until LPs are fully compensated. For example, assume a fund has a 20% incentive fee; however, with a modified HWM provision, the fund manager can only charge a 10% incentive fee until the fund regains 200% of the loss.

The **annuity view of hedge fund fees** refers to the stream of cash flows paid to the hedge fund manager in the form of management and performance fees. Investors should be aware that manager fees will increase over the life of the fund in dollar terms, assuming that the fund is profitable.

Incentive fees in private equity resemble call options by rewarding GPs only when a fund's net asset value (NAV) rises, with each calculation period resetting the option. Hurdle rates, typically based on IRR, increase the effective strike price, aligning interests to a point but also creating incentives for excessive risk-taking when the hurdle seems unattainable. This misalignment arises because option values rise with risk, while GPs face limited downside. When incentives are deep in the money, managers may become more conservative.

The **option view of incentive fees** demonstrates the ability of hedge fund managers to increase the present value of their fees by increasing the volatility of the portfolio's assets. Hedge fund performance fees are considered a **free call option** (i.e., an incentive fee option) granted to the fund managers on an annual basis. The payout function for the performance fee option can be expressed as follows:

$$\text{incentive fee payout} = \max [i(NAV_{end} - NAV_{beg}), 0]$$

where:

i = incentive fee percentage

NAV_{end} = NAV at end of period

NAV_{beg} = NAV at beginning of period

The **incentive fee option value** can be expressed using the Black-Scholes option pricing model. Under this model, five factors affect the value of the performance fee option: strike price, current NAV, risk-free rate, NAV volatility, and performance fee percentage.

A simpler approach to estimating the incentive fee call option value is the **at-the-money incentive fee approximation**:

$$\text{incentive fee call option value} = i \times 40\% \times \text{NAV} \times \sigma_1$$

The option-like nature of hedge fund performance fees influences hedge fund manager behavior as follows:

- Managers are inclined to increase fund volatility because volatility is positively related to the value of their incentive fee call option.
- When the option is far out of the money, the manager will be motivated to increase the volatility of the fund's strategy in an attempt to bring the option into the money or to attempt to renegotiate the incentive structure.

Empirical studies have found evidence that fund managers take more risks when the NAV is far out of the money. They also find managers take less risk to preserve their incentive fees when the incentive option is far in the money and refer to this behavior as the **lock-in effect**. There is also some evidence of **managing returns** and **massaging returns**, which suggests managers alter returns higher toward preferred targets in the month of December.

Managers may have several offsetting incentives, which may inhibit increasing the fund's volatility:

- The manager may have his own money invested in the fund.
- Poor performance will drive the NAV further below the high watermark, lowering the probability that the manager will collect future performance fees.
- Poor performance may lead investors to withdraw capital from the fund, reducing the management fee.
- The manager's reputation could be damaged by poor performance.

READING 2.3: QUANTITATIVE FOUNDATIONS

Compounded Returns

Compounding refers to the growth in value realized on a reinvested asset. Compounding recognizes interest earned on reinvested interest. Compounding increases overall return, but when calculating a return for a set beginning and ending dollar amount, the realized compounded return will be lower than the simple interest return, all else equal. Over discrete time periods, the simple holding period return (after one year of semiannual compounding) equals this:

$$R = \left(1 + \frac{R^{m=2}}{2}\right)^2 - 1$$

In finance, we are often interested in continuously compounded returns. **Continuous compounding** refers to the continuous reinvestment of interest, in which case the simple return will equal this:

$$R = e^{R^{m \to \infty}} - 1$$

Logarithms can be used to calculate the continuously compounded rate. Taking the natural logarithm of both sides of the continuous compounding equation and using the property of natural logarithms, we see this:

$$\ln(1 + R) = \ln(e^{R^{m \to \infty}}) = R^{m \to \infty}$$

In the previous equation, ln(1 + R) is the log return or continuously compounded return. Log returns greatly facilitate the calculation of the geometric mean return. We can calculate the **geometric mean return** using the arithmetic mean log return, *M*, as follows:

$$\text{geometric mean} = e^{M} - 1$$

Internal Rate of Return

The **internal rate of return (IRR)** is the discount rate that equates the present value of an investment's cash inflows with the present value of the investment's cash outflows. In other words, the IRR is the return associated with a zero net present value. The IRR is calculated using an iterative process with the following formula. Note that using the IRR function on your financial calculator will save you time on exam day.

$$CF_0 + \frac{CF_1}{(1 + IRR)} + \frac{CF_2}{(1 + IRR)^2} + \cdots + \frac{CF_T}{(1 + IRR)^T} = 0$$

The IRR is the standard measure of performance in the private equity and private real estate markets in which regular valuations of assets are not available. The IRR accounts for both the timing and magnitude of cash flows into and out of the investment.

The IRR is a highly useful method for calculating returns. However, the IRR is subject to several problems stemming from its assumptions and cash flow patterns:

- *Borrowing type cash flow patterns* (i.e., positive initial cash flow) change the interpretation of the IRR. In this case, a high IRR reflects the effective cost of borrowing, not the return on investment.
- *Multiple sign change cash flow patterns* may create multiple IRR solutions, and the number of solutions may equal the number of sign changes.
- There are *scale differences*, which are differences in the timing of cash flows or differences in investment size.
- *Differences in timing* arise when one investment lasts longer than another.
- IRRs also are problematic when *aggregating the results of several investments*. The combined IRR of two investments might not equal the average of the two individual investment IRRs.
- *IRR calculations assume that all cash flows are reinvested at a rate equal to IRR*. In cases where the reinvestment assumption is invalid, the modified IRR can be used, in which the investment's cash inflows are compounded at an assumed reinvestment rate and the investment's cash outflows are discounted at an assumed financing rate.

The IRR is a **dollar-weighted return** (or money-weighted return), meaning it is an average return that depends on the timing of cash distributions and withdrawals. In contrast, a **time-weighted return** (or g*eometric mean return*) is an average return that ignores the effects of

the timing of cash distributions or withdrawals. The use of the time-weighted return removes the distortions caused by the timing of cash flows and thus provides a better measure of a manager's ability to select investments over the period. Conversely, if the manager has complete control over money flows into and out of an account, the money-weighted return is the more appropriate performance measure.

Performance Measures for Illiquid Investments

Three ratios have been developed to measure performance for illiquid assets such as private equity. These measures include the following:

- **Distribution to paid-in (DPI) ratio.** This is the realized return, which compares cumulative distributions to total capital drawn.
- **Residual value to paid-in (RVPI) ratio.** This is the unrealized return, which compares the total value of unrealized investments to total capital drawn.
- **Total value to paid-in (TVPI) ratio.** This is the total value of distributions and unrealized investments to total capital drawn. The TVPI is equal to the sum of the DPI and RVPI.

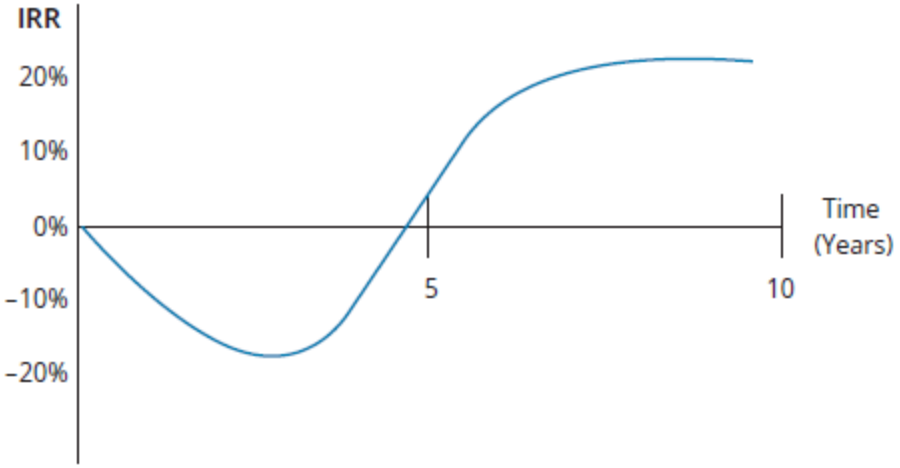
Another measure is the **public market equivalent (PME) method**, which is used to determine the incremental expected cash-weighted return associated with investing in private equity rather than a publicly traded (but similar risk) market index.

Accounting Conservatism and the J-Curve

Accounting conservatism results in liability and expense recognition before potential gain and revenue recognition. Private equity funds tend to have negative IRRs in the early years of the fund due to the recognition of expenses not meeting the qualification to be considered "assets."

The **J-curve** reflects low interim IRRs in the early years followed by positive IRRs in the later years due to accelerated losses or expenses early on and deferred profits recognized later. Private equity funds tend to follow this distribution.

Figure 1: J-Curve Example



Returns Based on Notional Principal

A **forward contract** is a bilateral contract that obligates one party to buy and one party to sell a specific quantity of an asset, at a set price, on a specific date in the future. The initial value of a forward contract is zero to both parties at contract initiation. This initial zero value creates a problem that requires us to use notional principal to determine investment returns.

Notional principal is the face amount of the underlying asset upon which cash flows on a derivative instrument (e.g., forward or swap) are based. The return on notional principal equals the gain or loss on a forward contract divided by the notional principal. However, this measure is misleading because the initial cash outflow does not equal the notional principal. A better method is to express the return on a fully collateralized basis, in which the forward contract is matched with capital equal to its notional principal.

$$R_{fcoll} = \ln(1 + R) + R_f$$

Alternatively, the return can be expressed on a partially collateralized basis, in which the forward contract is matched with capital equal to a percentage, *p*, of the forward contract's notional principal. A partially collateralized return is a leveraged return, where the leverage factor *L* equals 1 / *p*.

$$R_{pcoll} = [L \times \ln(1 + R)] + R_f$$

READING 2.4: STATISTICAL FOUNDATIONS

Summarizing Data

Summarizing data is an important component of statistical analysis. Data are often described according to a distribution of observations. **Ex post distributions** summarize historical or realized values of the random variable. **Ex ante distributions** summarize possible future values of the random variable.

Ex post distributions can be used to approximate ex ante distributions if the distribution has a constant mean and variance (i.e., it is stationary) and a large number of historical data points are available.

The normal distribution is frequently used in statistical analysis. The bell shape of the normal distribution makes it very useful for analyzing data from both an empirical and theoretical point of view. Empirical tests show the normal distribution approximates real-world data very well.