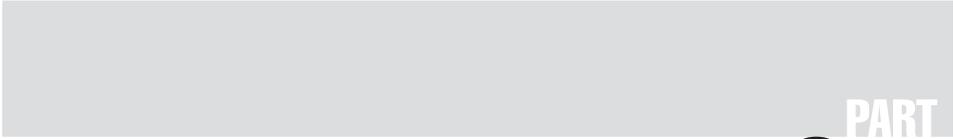


Alternative Investments

CAIA Level I

THIRD EDITION

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PART
One

Introduction to Alternative Investments

Part 1 begins with an introduction to alternative investments and a description of the environment of alternative investing. Chapters 3 to 6 include primers on quantitative methods, statistics, and financial economics as they relate to alternative investments, as well as a chapter on measures of risk and return. The last three chapters of Part 1 discuss performance attribution, hypothesis testing of risk and return, and multivariate and nonlinear methods. The material is designed to provide a foundation for Parts 2 to 5, which detail each of the four main categories of alternative investments.

What Is an Alternative Investment?

Definitions of what constitutes an alternative investment vary considerably. One reason for these differences lies in the purposes for which the definitions are being used. But definitions also vary because alternative investing is largely a new field for which consensus has not emerged, as well as a rapidly changing field for which consensus will probably always remain elusive.

Analyzing these various definitions provides a useful starting point to understanding alternative investments. So we begin this introductory chapter by examining commonly used methods of defining alternative investments.

1.1 ALTERNATIVE INVESTMENTS BY EXCLUSION

Alternative investments are sometimes viewed as including any investment that is not simply a long position in traditional investments. Typically, **traditional investments** include publicly traded equities, fixed-income securities, and cash. For example, if a particular investment (such as private equity) is not commonly covered as equity in books on investing, then many people would view it as an alternative investment.

The alternative-investments-by-exclusion definition is overly broad for the purposes of the CAIA curriculum. First, the term *investment* covers a very broad spectrum. A good definition of an **investment** is that it is deferred consumption. Any net outlay of cash made with the prospect of receiving future benefits might be considered an investment. So investments can range from planting a tree to buying stocks to acquiring a college education. As such, a more accurate definition of alternative investments requires more specificity than simply that of being nontraditional.

This book and the overall CAIA curriculum are focused on institutional-quality alternative investments. An **institutional-quality investment** is the type of investment that financial institutions such as pension funds or endowments might include in their holdings because they are expected to deliver reasonable returns at an acceptable level of risk. For example, a pension fund would consider holding the publicly traded equities of a major corporation but may be reluctant to hold collectibles such as baseball cards or stamps. Also, investments in very small and very speculative projects are typically viewed as being inappropriate for such an institution due to its responsibility to select investments that offer suitable risk levels and financial return prospects for its clients.

Not every financial institution, or even every type of financial institution, invests in alternative investments. Some financial institutions, such as some brokerage firms,

are not focused on making long-term investments; rather, they hold securities to provide services to their clients. Other financial institutions, such as deposit-taking institutions like banks (especially smaller banks) might invest in only traditional investments because of government regulations or because of lack of expertise.

Of course, institutional-quality alternative investments are also held by entities other than financial institutions. Chapter 2 of this book discusses the alternative investment environment, including the various entities that commonly hold them (e.g., endowment funds and wealthy individuals).

1.2 ALTERNATIVE INVESTMENTS BY INCLUSION

Another method of identifying alternative investments is to define explicitly which investments are considered to be alternative. In this book, we classify four types of alternative investments:

1. **REAL ASSETS** (including natural resources, commodities, real estate, infrastructure, and intellectual property)
2. **HEDGE FUNDS** (including managed futures)
3. **PRIVATE EQUITY** (including mezzanine and distressed debt)
4. **STRUCTURED PRODUCTS** (including credit derivatives)

These four categories correspond to Parts 2 to 5 of this book. Our list is not an exhaustive list of all alternative investments, especially because the CAIA curriculum is focused on institutional-quality investments. Furthermore, some of the investments on the list can be classified as traditional investments rather than alternative investments. For example, real estate and especially real estate investment trusts are frequently viewed as being traditional institutional-quality investments. Nevertheless, this list includes most institutional-quality investments that are currently commonly viewed as alternative. Exhibit 1.1 illustrates the relative proportion of these four categories of alternative investments.

The following sections provide brief introductions to the four categories.

1.2.1 Real Assets

Real assets are investments in which the underlying assets involve direct ownership of nonfinancial assets rather than ownership through financial assets, such as the securities of manufacturing or service enterprises. Real assets tend to represent more direct claims on consumption than do common stocks, and they tend to do so with less reliance on factors that create value in a company, such as intangible assets and managerial skill. So while a corporation such as Google holds real estate and other real assets, the value to its common stock is highly reliant on perceptions of the ability of the firm's management to oversee creation and sales of its goods and services.

An aspect that distinguishes types of real assets is the extent to which the ownership of the real assets involves operational aspects, such as day-to-day management decisions that have substantial impacts on the performance of the assets. For example, in many instances, direct ownership of oil reserves or stockpiles of copper involve

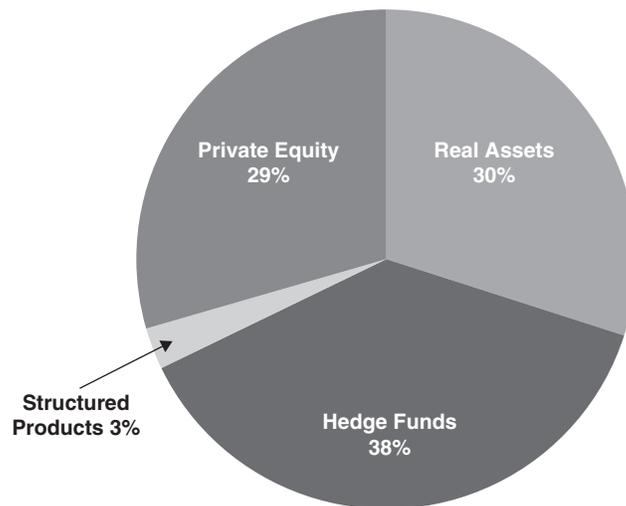


EXHIBIT 1.1 Major Alternative Asset Categories (percentages approximate), 2014
Source: Global Alternatives Survey 2014, Towers Watson; CAIA Association estimates.

substantially less day-to-day managerial attention than does direct ownership of real estate, infrastructure, or intellectual property.

Natural resources focus on direct ownership of real assets that have received little or no alteration by humans, such as mineral and energy rights or reserves. Commodities are differentiated from natural resources by their emphasis on having been extracted or produced. **Commodities** are homogeneous goods available in large quantities, such as energy products, agricultural products, metals, and building materials. Most of the investments covered in the commodities section of the CAIA curriculum involve futures contracts, so understanding futures contracts is an important part of understanding commodities. Futures contracts are regulated distinctly and have well-defined economic properties. For example, the analysis of futures contracts typically emphasizes notional amounts rather than the amount of money posted as collateral or margin to acquire positions.

Commodities as an investment class refer to investment products with somewhat passive (i.e., buy-and-hold) exposure to commodity prices. This exposure can be obtained through futures contracts, physical commodities, natural resource companies, and exchange-traded funds. Actively traded futures contracts on commodities are discussed in Part 3 on hedge funds and managed futures.

Some real assets are operationally focused. For the purposes of the CAIA curriculum, **operationally focused real assets** include real estate, land, infrastructure, and intellectual property. The performance of these types of real assets is substantially affected by the skill and success of regular and relatively frequent managerial decision-making. Traditional common stocks are typically even more highly operationally focused.

Real estate focuses on land and improvements that are permanently affixed, like buildings. Real estate was a significant asset class long before stocks and bonds

became important. Prior to the industrial age, land was the single most valuable asset class. Only a few decades ago, real estate was the most valuable asset of most individuals, because ownership of a primary residence was more common than ownership of financial investments.

Land comprises a variety of forms, including undeveloped land, timberland, and farmland. Although undeveloped land might appear to belong under the category of natural resources rather than operationally focused real assets, the option to develop land often requires substantial and ongoing managerial decision-making. **Timberland** includes both the land and the timber of forests of tree species typically used in the forest products industry. While the underlying land is a natural resource, timberland requires some level of ongoing management. Finally, **farmland** consists of land cultivated for row crops (e.g., vegetables and grains) and permanent crops (e.g., orchards and vineyards). Farmland necessitates substantial operations and managerial decisions.

Infrastructure investments are claims on the income of toll roads, regulated utilities, ports, airports, and other real assets that are traditionally held and controlled by the public sector (i.e., various levels of government). Investable infrastructure opportunities include securities generated by the privatization of existing infrastructure or by the private creation of new infrastructure via private financing.

Finally, while some descriptions of real assets limit the category to tangible assets, we define real assets to include intangible assets, such as intellectual property (e.g., patents, copyrights, and trademarks, as well as music, film, and publishing royalties). The opposite of a real asset is a financial asset, not an intangible asset. A **financial asset** is not a real asset—it is a claim on cash flows, such as a share of stock or a bond. Intangible assets, such as technology, directly facilitate production, thereby creating increased value. It can be argued that intangible assets represent a very large and rapidly increasing role in the wealth of society.

1.2.2 Hedge Funds

Hedge funds represent perhaps the most visible category of alternative investments. While hedge funds are often associated with particular fee structures or levels of risk taking, we define a **hedge fund** as a privately organized investment vehicle that uses its less regulated nature to generate investment opportunities that are substantially distinct from those offered by traditional investment vehicles, which are subject to regulations such as those restricting their use of derivatives and leverage. Hedge funds represent a wide-ranging set of vehicles that are differentiated primarily by the investment strategy or strategies implemented. Managed futures funds are included as hedge funds in Part 3.

1.2.3 Private Equity

The term **private equity** is used in the CAIA curriculum to include both equity and debt positions that, among other things, are not publicly traded. In most cases, the debt positions contain so much risk from cash flow uncertainty that their short-term return behavior is similar to that of equity positions. In other words, the value of the debt positions in a highly leveraged company, discussed within the category of

private equity, behaves much like that of the equity positions in the same firm, especially in the short run. Private equity investments emerge primarily from funding new ventures, known as venture capital; from the equity of leveraged buyouts of existing businesses; from mezzanine financing of leveraged buyouts or other ventures; and from distressed debt resulting from the decline in the health of previously healthy firms.

Venture capital refers to support via equity financing to start-up companies that do not have a sufficient size, track record, or desire to attract capital from traditional sources, such as public capital markets or lending institutions. Venture capitalists fund these high-risk, illiquid, and unproven ideas by purchasing senior equity stakes while the start-up companies are still privately held. The ultimate goal is to generate large profits primarily through the business success of the companies and their development into enterprises capable of attracting public investment capital (typically through an initial public offering, or IPO) or via their sale to other companies. In the context of investment management, venture capital is sometimes treated as a separate asset class from other types of private equity.

Leveraged buyouts (LBOs) refer to those transactions in which the equity of a publicly traded company is purchased using a small amount of investor capital and a large amount of borrowed funds in order to take the firm private. The borrowed funds are secured by the assets or cash flows of the target company. The goals can include exploiting tax advantages of debt financing, improving the operating efficiency and the profitability of the company, and ultimately taking the company public again (i.e., making an IPO of its new equity). Management buyouts and management buy-ins are types of LBOs with specific managerial changes.

Mezzanine debt derives its name from its position in the capital structure of a firm: between the ceiling of senior secured debt and the floor of equity. Mezzanine debt refers to a spectrum of risky claims, including preferred stock, convertible debt, and debt that includes equity kickers (i.e., options that allow investors to benefit from any upside success in the underlying business, also called hybrid securities).

Distressed debt refers to the debt of companies that have filed or are likely to file in the near future for bankruptcy protection. Even though these securities are fixed-income securities, distressed debt is included in our discussion of private equity because the future cash flows of the securities are highly risky and highly dependent on the financial success of the distressed companies, and thus share many similarities with common stock. Private equity firms investing in distressed debt tend to take longer-term ownership positions in the companies after converting all or some portion of their debt position to equity. Some hedge funds also invest in distressed debt, but they tend to do so with a shorter-term trading orientation.

1.2.4 Structured Products

Structured products are instruments created to exhibit particular return, risk, taxation, or other attributes. These instruments generate unique cash flows as a result of partitioning the cash flows from a traditional investment or linking the returns of the structured product to one or more market values. The simplest and most common example of a structured product is the creation of debt securities and equity securities in a traditional corporation. The cash flows and risks of the corporation's assets are structured into a lower-risk fixed cash flow stream (bonds) and a higher-risk residual

cash flow stream (stock). The structuring of the financing sources of a corporation creates option-like characteristics for the resulting securities.

Collateralized debt obligations (CDOs) and similar instruments are among the best-known types of structured products. CDOs partition the actual or synthetic returns from a portfolio of assets (the collateral) into securities with varied levels of seniority (the tranches).

Credit derivatives, another popular type of structured product, facilitate the transfer of credit risk. Most commonly, credit derivatives allow an entity (the credit protection buyer) to transfer some or all of a credit risk associated with a specific exposure to the party on the other side of the derivative (the credit protection seller). The credit protection seller might be diversifying into the given credit risk, speculating on the given credit risk, or hedging a preexisting credit exposure.

Historically, the term *structured products* has referred to a very broad spectrum of products, including CDOs and credit derivatives. In recent decades, however, the term is being used to describe a narrower set of financially engineered products. These products are issued largely with the intention of meeting the preferences of investors, such as providing precisely crafted exposures to the returns of an index or a security. For example, a major bank may issue a product designed to offer downside risk protection to investors while also offering the potential for the investor to receive a portion of the upside performance in an index. Part 5 discusses these specially designed structured products along with more generic structured products, including credit derivatives and CDOs.

When the structuring process creates instruments that do not behave like traditional investments, those instruments are considered alternative investments.

1.2.5 Limits on the Categorizations

These four categories of alternative investments are the focus of the CAIA curriculum. While the categorization helps us understand the spectrum of alternative investments, the various alternative investment categories may overlap. For example, some hedge fund portfolios may contain substantial private equity or structured product exposures and may even substantially alternate the focus of their holdings through time. This being said, the four categories discussed in the previous sections represent the investment types central to the Level I curriculum of the CAIA program.

1.3 STRUCTURES AMONG ALTERNATIVE INVESTMENTS

The previous sections defined the category of alternative investments by describing the investments that are or are not commonly thought of as alternative. But the question remains as to what the defining characteristics of investments are that cause them to be classified as alternative. For example, why is private equity considered an alternative investment but other equities are considered traditional investments? What is the key characteristic or attribute that differentiates these equities? The answer is that traditional equities are listed on major stock exchanges whereas private equity is not. We use the term *structure* to denote this attribute and others that differentiate traditional and alternative investments. In this case, traditional equities possess the

characteristic of public ownership, which can be viewed as a type of institutional structure.

Because structures are a descriptive and definitional component of alternative investments, they are a crucial theme to our analysis of asset classes. Structures denote a related set of important aspects that identify investments and distinguish them from other investments. There are five primary types of structures:

1. Regulatory structures
2. Securities structures
3. Trading structures
4. Compensation structures
5. Institutional structures

For example, mutual funds are usually considered to be traditional investments, and hedge funds are usually considered to be alternative investments. But many hedge funds invest in the same underlying securities as many mutual funds (e.g., publicly traded equities). So if they have the same underlying investments, what distinguishes them? If we look at the funds in the context of the five structures, we can develop insight as to the underlying or fundamental differences. For example, hedge funds are less regulated, often have different compensation structures, and often have highly active and esoteric trading strategies or structures. Each of these attributes is viewed as a structure in this book.

When we analyze a particular type of investment, such as managed futures, we should think about the investment in the context of these various structures: Which structural aspects are unique to managed futures, how do particular structural aspects affect managed futures returns, and how do particular structural aspects cause us to need new or modified methods for our analysis?

1.3.1 Structures as Distinguishing Aspects of Investments

Exhibit 1.2 illustrates the concept of structures. On the left-hand side is the ultimate source of all investment returns: real assets and the related economic activity that generates and underlies all economic compensation to investors. The cash flows from those assets emanate toward the investors on the right. The placement of the second box illustrates conceptually the idea that various structures alter, shape, and

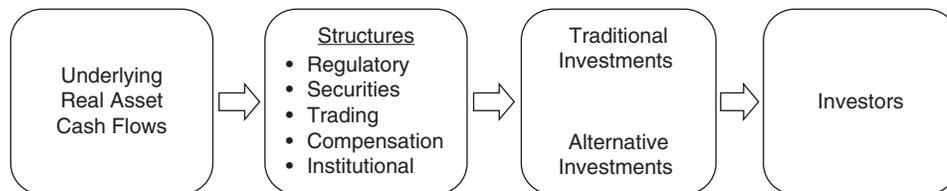


EXHIBIT 1.2 Structures Distinguish Alternative Investments from Traditional Investments

otherwise influence the flow of the economic benefits of the assets to the ultimate investors. The five major types of structures are listed in no particular order: regulatory, securities, trading, compensation, and institutional. The third box lists the types of investment claims that receive the altered cash flows: traditional investments and alternative investments. Finally, at the right are the ultimate recipients of the economic benefits: the investors.

For example, the underlying assets on the left-hand side of Exhibit 1.2 might include chains of hotels. Some of those hotels are ultimately owned by investors as shares of publicly traded corporations, such as Hyatt and Marriott, which are usually considered to be traditional investments. Other hotel investments, such as those owned by investors as real estate investment trusts (e.g., Host Hotels & Resorts Inc.) and those held privately (e.g., Omni Hotels), are usually considered to be alternative investments. Exhibit 1.2 illustrates the differences between these hotel ownership methods as being the structures that transform the attributes of ownership through institutional effects such as public listing, regulatory effects such as taxes, and compensation effects such as managerial compensation schemes.

The primary point of Exhibit 1.2 is that structures alter the flows of cash from their underlying source (real assets) to their ultimate recipients (investors). In most corporations, the cash flows from the firm's assets are divided into debt claims and equity claims by the firm's capital structure. This is a common and important example of a structure: in this case, a securities structure. Structures define the characteristics of each investment; viewing investments in the context of these structures provides an organized and systematic framework for analysis.

The exhibit is not intended to portray all investments as being influenced by all five structures. Some investments, such as a vegetable garden used for personal consumption, are not substantially subjected to any of these structures. In this example, there are no securities involved, there would typically be no important legal structures or issues, there is no investment manager layering a sophisticated trading strategy on top of the garden's output, and so forth.

Some investments are substantially subjected to only one or two structures, and some investments are subjected to most or all. Investments can also be subjected to multiple layers of one particular type of structure, such as securities structures. For example, the economic rights to a residential property are often structured into a mortgage and the homeowner's equity (residual claim). The mortgage might be sold into a pool of mortgages and securitized into a pass-through certificate. The pass-through certificate might be structured into a tranche of a collateralized mortgage obligation (CMO) that is in turn held by a mutual fund before finally being held by the ultimate investor in a mutual fund inside a retirement account. Thus, an investment may have various and numerous distinguishing structures that identify it and give it its characteristics. The goal is to use this view of structures to clarify, distinguish, and organize our understanding of alternative investments. The following paragraphs provide an overview of the five primary structures related to alternative investments:

1. **Regulatory structure** refers to the role of government, including both regulation and taxation, in influencing the nature of an investment. For example, hedge funds (but not their managers) are often less regulated and typically must be formed in particular ways to avoid higher levels of regulation. Taxation is

another important feature of government influence that can motivate the existence of some investment products and plays a major role in the transformation of underlying asset cash flows into investment products.

2. **Securities structure** refers to the structuring of cash flows through leverage and securitization. Securitization is the process of transforming asset ownership into tradable units. Cash flows may be securitized simply on a pass-through basis (i.e., a pro rata or *pari passu* basis). Cash flows can also be structured through partitioning into financial claims with different levels of risk or other characteristics, such as the timing or taxability of cash flows. The use of securities and security structuring transforms asset ownership into potentially distinct and diverse tradable investment opportunities. The nature of this transformation drives and shapes the nature of the resulting investments, the characteristics of the resulting returns, and the types of methods that are needed for investment analysis. On the other hand, lack of easily tradable ownership units can drive the selection and implementation of investment methods.
3. **Trading structure** refers to the role of an investment vehicle's investment managers in developing and implementing trading strategies. A buy-and-hold management strategy will have a minor influence on underlying investment returns, while an aggressive, complex, fast-paced trading strategy can cause the ultimate cash flows from a fund to differ markedly from the cash flows of the underlying assets. The trading strategy embedded in an alternative asset such as a fixed-income arbitrage hedge fund is often the most important structure in determining the investment's characteristics.
4. **Compensation structure** refers to the ways that organizational issues, especially compensation schemes, influence particular investments. Thus, in the case of a hedge fund, compensation structures would include the financial arrangements contained in the limited partnership formed by the investors and the entity used by the fund's managers. Such arrangements usually determine the exposure of the fund's investment managers to the financial risk of the investment, the fee structures used to compensate and reward managers, and the potential conflicts of interest between parties. Compensation structures within investments, especially alternative investments, have implications for the agency costs generated by owner-manager relationships.
5. **Institutional structure** refers to the financial markets and financial institutions related to a particular investment, such as whether the investment is publicly traded. Public trading or listing of a security is an essential driver of an investment's nature. Other institutional structures can determine whether an investment is regularly traded, is held by individuals at the retail level, or tends to be traded and held by large financial institutions such as pension funds and foundations.

1.3.2 Structures and the Four Alternative Investment Types

It would be difficult to find a major investment that is not influenced or shaped in at least some small way by each of the five primary structures. However, many investments tend to be most heavily influenced by only a subset of those structures. This section provides a general indication of the five structures that most influence the four alternative asset types of this book.

1. **REAL ASSETS** such as natural resources and commodities tend to have relatively fewer influences from structures, although the value and management of natural resources are often quite subject to regulations. Commodities are primarily driven by their securities structure, since they are usually traded using futures contracts, but tend not to be heavily influenced by other structures. Operationally focused real assets are dominated in size by land and real estate. The majority of land and real estate has the institutional structure of being privately held and traded. The use of securities in the structuring of cash flows and securitization has also been important in driving the nature of real estate investments. Infrastructure often includes heavy regulatory structures, while intellectual property often includes issues related to compensation structures.
2. **HEDGE FUNDS** are primarily driven by the trading structure: the use of active, complex, and proprietary trading strategies. Hedge funds are also distinguished by regulatory structures (e.g., the use of offshore structures due to tax regulations) and compensation structures, including the use of performance-based investment management fees.
3. **PRIVATE EQUITY** is clearly distinguished by the institutional structure that it is not publicly traded. Compensation, securities, and trading structures also play nontrivial roles in shaping the nature of private equity.
4. **STRUCTURED PRODUCTS** are clearly distinguished by the securities structure. However, structured products are also typically moderately influenced by institutional, regulatory, and compensation structures.

1.3.3 Limits on Categorization

Structures are an essential concept in understanding the nature of an investment; however, they are not necessarily a defining feature of alternative investments. For example, can we view an investment as an alternative investment if it is substantially affected by a particular number of these aspects? The answer is no. Some alternative investments, such as timberland, have minimal influences from structures. Typically, the cash flows of the underlying timberland are not substantially altered by structures as they pass from the underlying real assets to the ultimate investor. On the other hand, investments such as equity derivatives and interest rate derivatives can be heavily structured and regulated and yet be considered in many cases to be traditional investments.

The concept of the five structures is designed to help us understand and analyze investment products but not necessarily to define classes of securities. The context of these five structures can help identify an investment's distinguishing characteristics. Structures help explain why some investments offer different return characteristics than others and why some investments require different methods of analysis than others; these topics are covered in the next two sections.

1.4 INVESTMENTS ARE DISTINGUISHED BY RETURN CHARACTERISTICS

A popular way of distinguishing between traditional and alternative investments is by their return characteristics. Investment opportunities exhibiting returns that are

substantially distinct from the returns of traditional stocks and bonds might be viewed as being alternative investments. Stock returns in this context refer to the returns of publicly traded equities; similarly, bond returns refer to the returns of publicly traded fixed-income securities.

1.4.1 Diversification

An investment opportunity with returns that are uncorrelated with or only slightly correlated with traditional investments is often viewed as an alternative investment. An attractive aspect of this lack of correlation is that it indicates the potential to diversify risk. In this context, many alternative investments are referred to as diversifiers. A **diversifier** is an investment with a primary purpose of contributing diversification benefits to its owner. **Absolute return products** are investment products viewed as having little or no return correlation with traditional assets, and have investment performance that is often analyzed on an absolute basis rather than relative to the performance of traditional investments. Diversification can lower risk without necessarily causing an offsetting reduction in expected return and is therefore generally viewed as a highly desirable method of generating improved risk-adjusted returns.

Sometimes alternative assets are viewed as synonymous with diversifiers or absolute return products. But clearly most types of investments, such as private equity, REITs, and particular styles of hedge funds, have returns that are at least modestly correlated with public equities over medium- to long-term time horizons and are still viewed as alternative investments. Accordingly, this non-correlation-based view of alternative investments does not provide a precise demarcation between alternative and traditional investments. Nevertheless, having distinct returns is often an important characteristic in differentiating alternative investments from traditional investments.

Alternative investments may be viewed as being likely to have return characteristics that are different from stocks and bonds, as demonstrated by their lack of correlation with stocks and bonds. The distinctions between traditional and alternative investments are also indicated by several common return characteristics found among alternative investments that either are not found in traditional investments or are found to a different degree. The following three sections discuss the most important potential return characteristic distinctions.

1.4.2 Illiquidity

Traditional investments have the institutional structure of tending to be frequently traded in financial markets with substantial volume and a high number of participants. Therefore, their returns tend to be based on liquid prices observed from reasonably frequent trades at reasonable levels of volume. Many alternative investments are illiquid. In this context, **illiquidity** means that the investment trades infrequently or with low volume (i.e., thinly). Illiquidity implies that returns are difficult to observe due to lack of trading, and that realized returns may be affected by the trading decisions of just a few participants. Other assets, often termed **lumpy assets**, are assets that can be bought and sold only in specific quantities, such as a large real estate project. Thin trading causes a more uncertain relationship between the most recently observed price and the likely price of the next transaction. Generally, illiquid assets

tend to fall under the alternative investment classification, whereas traditional assets tend to be liquid assets.

The risk of illiquid assets may be compensated for by higher returns. An illiquid asset can be difficult or expensive to sell, as thin volume or lockup provisions prevent the immediate sale of the asset at a price close to its potential sales value. The urgent sale of an illiquid asset can therefore be at a price that is considerably lower than the value that could be obtained from a long-term comprehensive search for a buyer. Given the difficulties of selling and valuing illiquid investments, many investors demand a risk premium, or a price discount, for investing in illiquid assets. While some investors may avoid illiquid investments at all costs, others specifically increase their allocation to illiquid investments in order to earn this risk premium.

1.4.3 Inefficiency

The prices of most traditional investments are determined in markets with relatively high degrees of competition and therefore with relatively high efficiency. In this context, competition is described as numerous well-informed traders able to take long and short positions with relatively low transaction costs and with high speed. **Efficiency** refers to the tendency of market prices to reflect all available information. Efficient market theory asserts that arbitrage opportunities and superior risk-adjusted returns are more likely to be identified in markets that are less competitively traded and less efficient. (Market efficiency is detailed in Chapter 6.) Many alternative investments have the institutional structure of trading at inefficient prices. **Inefficiency** refers to the deviation of actual prices from valuations that would be anticipated in an efficient market. Informationally inefficient markets are less competitive, with fewer investors, higher transaction costs, and/or an inability to take both long and short positions. Accordingly, alternative investments may be more likely than traditional investments to offer returns based on pricing inefficiencies.

1.4.4 Non-Normality

To some extent, the returns of almost all investments, especially the short-term returns on traditional investments, can be approximated as being normally distributed. The normal distribution is the commonly discussed bell-shaped distribution, with its peaked center and its symmetric and diminishing tails. The return distributions of most investment opportunities become nearer to the shape of the normal distribution as the time interval of the return computation nears zero and as the probability and magnitude of jumps or large moves over a short period of time decrease. However, over longer time intervals, the returns of many alternative investments exhibit non-normality, in that they cannot be accurately approximated using the standard bell curve. The non-normality of medium- and long-term returns is a potentially important characteristic of many alternative investments.

What structures cause non-normality of returns? First and foremost, many alternative investments are structured so that they are infrequently traded; therefore, their market returns are measured over longer periods of time. These longer time intervals combine with other aspects of alternative investment returns to make alternative investments especially prone to return distributions that are poorly approximated using the normal distribution. These irregular return distributions may arise from

several sources, including (1) securities structuring, such as with a derivative product that is nonlinearly related to its underlying security or with an equity in a highly leveraged firm, and (2) trading structures, such as an active investment management strategy alternating rapidly between long and short positions.

Non-normality of returns introduces a host of complexities and lessens the effectiveness of using methods based on the assumption of normally distributed returns. Many alternative investments have especially non-normal returns compared to traditional investments; therefore, the category of alternative investments is often associated with non-normality of returns.

1.5 INVESTMENTS ARE DISTINGUISHED BY METHODS OF ANALYSIS

The previous section outlined return characteristics of alternative investments that distinguished them from traditional investments: diversifying, illiquid, inefficient, and non-normal. Alternative investments can also be distinguished from traditional investments through the methods used to analyze, measure, and manage their returns and risks. As in the previous case, the reasons for the difference lie in the underlying structures: Alternative investments have distinct regulatory, securities, trading, compensation, and institutional structures that necessitate distinct methods of analysis.

Public equity returns are extensively examined using both theoretical analysis and empirical analysis. Theoretical models, such as the capital asset pricing model, and empirical models, such as the Fama-French three-factor model, detailed in Chapter 6, are examples of the extensive and highly developed methods used in public equity return analysis. Analogously, theories and empirical studies of the term structure of interest rates and credit spreads arm traditional fixed-income investors with tools for predicting returns and managing risks. But alternative investments do not tend to have an extensive history of well-established analysis, and in many cases the methods of analysis used for traditional investments are not appropriate for these investments due to their structural differences.

Alternative investing requires alternative methods of analysis. In summary, a potential definition of an alternative investment is any investment for which traditional investment methods are clearly inadequate. There are four main types of methods that form the core of alternative investment return analysis.

1.5.1 Return Computation Methods

Return analysis of publicly traded stocks and bonds is relatively straightforward, given the transparency in regularly observable market prices, dividends, and interest payments. Returns to some alternative investments, especially illiquid investments, can be problematic. One major issue is that in many cases, a reliable value of the investment can be determined only at limited points in time. In the extreme, such as in most private equity deals, there may be no reliable measure of investment value at any point in time other than at termination, when the investment's value is the amount of the final liquidating cash flow. This institutional structure of infrequent trading drives the need for different return computation methods.

Return computation methods for alternative investments are driven by their structures and can include such concepts as internal rate of return (IRR), the computation of which over multiple time periods uses the size and timing of the intervening cash flows rather than the intervening market values. Also, return computation methods for many alternative investments may take into account the effects of leverage. While traditional investments typically require the full cash outlay of the investment's market value, many alternative contracts can be entered into with no outlay other than possibly the posting of collateral or margin or, as in the case of private equity, commitments to make a series of cash contributions over time. In the case of no investment outlay, the return computations may use alternative concepts of valuation, such as notional principal amounts. In the case of multiple cash contribution commitments, IRR is used. Chapter 3 provides details regarding return computation methods that facilitate analysis of alternative investments.

1.5.2 Statistical Methods

The traditional assumption of near-normal returns for traditional investments offers numerous simplifications. First, the entire distribution of an investment with normally or near-normally distributed returns can be specified with only two parameters: (1) the mean of the distribution, and (2) the standard deviation, or variance, of the distribution. Much of traditional investment analysis is based on the representation of an investment's return distribution using only the mean and standard deviation. Further, numerous statistics, tests, tables, and software functions are readily available to facilitate the analysis of a normally distributed variable.

But as indicated previously in this chapter, many alternative investments exhibit especially non-normally distributed returns over medium- and long-term time intervals. Non-normality is usually addressed through the analysis of higher moments of the return distributions, such as skewness and kurtosis. Accordingly, the analysis of alternative investments typically requires familiarity with statistical methods designed to address this non-normality caused by institutional structures like thin trading, securities structures like tranching, and trading structures like alternating risk exposures. An example of a specialized method is in risk management: While a normal distribution is symmetrical, the distributions of some alternative investments can be highly asymmetrical and therefore require specialized risk measures that specifically focus on the downside risks. Chapter 5 introduces some of these methods.

1.5.3 Valuation Methods

Fundamental and technical methods for pricing traditional securities and potentially identifying mispriced securities constitute a moderately important part of the methods used in traditional investments. In traditional investments, fundamental equity valuation tends to focus on relatively healthy corporations engaged in manufacturing products or providing services, and tends to use methods such as financial statement analysis and ratio analysis. Many hedge fund managers use the same general fundamental and technical methods in attempting to identify mispriced stocks and bonds. However, hedge fund managers may also use methods specific to alternative

investments, such as those used in highly active trading strategies and strategies based on identifying relative mispricings. For example, a quantitative equity manager might use a complex statistical model to identify a pair of relatively overpriced and underpriced stocks that respond to similar risk factors and are believed to be likely to converge in relative value over the next day or two. Additionally, alternative investing tends to focus on the evaluation of fund managers, while traditional investing tends to focus more on the valuation of securities.

Methods for valuing some types of alternative investments are quite distinct from the traditional methods used for valuing stocks and bonds. Here are several examples:

- Alternative investment management may include analyzing active and rapid trading that focuses on shorter-term price fluctuations than are common in traditional investment management.
- Alternative investment analysis often requires addressing challenges imposed by the inability to observe transaction-based prices on a frequent and regular basis. The challenges in illiquid markets relate to determining data for comparison (i.e., benchmarking), since reliable market values are not continuously available.
- Alternative investments such as real estate, private equity, and structured products tend to have unique cash flow forecasting challenges.
- Alternative investments such as some real estate and private equity funds use appraisal methods that are estimates of the current value of the asset, which may differ from the price that the asset would achieve if marketed to other investors.

These specialized pricing and valuation methods are driven by the structures that determine the characteristics of alternative investments.

1.5.4 Portfolio Management Methods

Finally, issues such as illiquidity, non-normal returns, and increased potential for inefficient pricing introduce complexities for portfolio management techniques. Most of the methods used in traditional portfolio management rely on assumptions such as the ability to transact quickly, relatively low transaction costs, and often the ability to confine an analysis to the mean and variance of the portfolio's return.

In contrast, portfolio management of alternative investments often requires the application of techniques designed to address such issues as the non-normality of returns and barriers to continuous portfolio adjustments. Non-normality techniques may involve skewness and kurtosis, as opposed to just the mean and variance. In traditional investments, the ability to transact quickly and at low cost often allows for the use of short-term time horizons, since the portfolio manager can quickly adjust positions as conditions change. The inability to trade some alternative investments like private equity quickly and at low cost adds complexity to the portfolio management process, such as liquidity management, and mandates understanding of specialized methods. Finally, alternative investment portfolio management tends to focus more on the potential for assets to generate superior returns.

1.6 INVESTMENTS ARE DISTINGUISHED BY OTHER FACTORS

Three other issues help form the complex differentiation between alternative and traditional investments: information asymmetries, incomplete markets, and innovation.

Information asymmetries refer to the extent to which market participants possess different data and knowledge. In traditional investments, most securities are regulated and are required to disclose substantial information to the public. Many alternative investments are private placements, and therefore the potential for large information asymmetries is greater. These information asymmetries raise substantial issues for financial analysis and portfolio management.

Incomplete markets refer to markets with insufficient distinct investment opportunities. The lack of distinct investment opportunities prevents market participants from implementing an investment strategy that satisfies their exact preferences, such as their preferences regarding risk exposures. In an ideal world, securities could be costlessly created to meet every investor need. For example, an investor may desire an insurance contract that contains a specific clause regarding payouts, but regulations may make such clauses illegal. Or perhaps a contract with regard to a potential risk may be subject to unacceptable moral hazard. **Moral hazard** is that risk that the behavior of one or more parties will change after entering into a contract. As a result of this inability to contract efficiently, the investor might be unable to diversify perfectly. Trading structures in some alternative investments, such as large minimum investment sizes, can be viewed as exacerbating the problem of incomplete markets and the investment challenges that accompany them.

Finally, substantial degrees of innovation permeate the world of alternative investments, from the nascent enterprises of venture capital to the pioneering structures implemented in financial derivatives. The new and rapidly changing nature of alternative investments raises issues regarding methods of financial analysis and portfolio management that distinguish the study of alternative investments from the study of traditional investments.

1.7 GOALS OF ALTERNATIVE INVESTING

Having defined *what* alternative investments are from a variety of perspectives, we introduce the questions of *how* and *why* people pursue alternative investing. Understanding the goals of alternative investing is essential; the following sections provide an introduction to the most important of these goals.

1.7.1 Active Management

Active management refers to efforts of buying and selling securities in pursuit of superior combinations of risk and return. Alternative investment analysis typically focuses on evaluating active managers and their systems of active management, since most alternative investments are actively managed. Active management is the converse of passive investing. **Passive investing** tends to focus on buying and holding securities in an effort to match the risk and return of a target, such as a highly

diversified index. An investor's risk and return target is often expressed in the form of a **benchmark**, which is a performance standard for a portfolio that reflects the preferences of an investor with regard to risk and return. For example, a global equity investment program may have the MSCI World Index as its benchmark. The returns of the fund would typically be compared to the **benchmark return**, which is the return of the benchmark index or benchmark portfolio.

Active management typically generates active risk and active return. **Active risk** is that risk that causes a portfolio's return to deviate from the return of a benchmark due to active management. **Active return** is the difference between the return of a portfolio and its benchmark that is due to active management. An important goal in alternative investing is to use active management to generate an improved combination of risk and return.

Active management is an important characteristic of almost all alternative investments. Unlike traditional investing, in which the focus is often on security analysis and passive portfolio management, the focus of alternative investing is often on analyzing the ability of the fund to generate attractive returns through active management.

1.7.2 Absolute and Relative Returns

The concepts of benchmark returns, absolute return products, and investment diversifiers have been briefly introduced in this chapter. Let's examine these and other concepts in more detail. In alternative investing, there are two major standards against which to evaluate returns: absolute and relative.

An **absolute return standard** means that returns are to be evaluated relative to zero, a fixed rate, or relative to the riskless rate, and therefore independently of performance in equity markets, debt markets, or any other markets. Thus, an investment program with an absolute return strategy seeks positive returns unaffected by market directions. An example of an absolute return investment fund is an equity market-neutral hedge fund with equal-size long and short positions in stocks that the manager perceives as being undervalued and overvalued, respectively. The fund's goal is to hedge away the return risk related to the level of the equity market and to exploit security mispricings to generate positive returns.

A **relative return standard** means that returns are to be evaluated relative to a benchmark. An investment program with a relative return standard is expected to move in tandem with a particular market but has a goal of consistently outperforming that market. An example of a fund with a relative return strategy is a long-only global equity fund that diversifies across various equity sectors and uses security selection in an attempt to identify underpriced stocks. The fund's goal is to earn the benchmark return from the fund's exposure to the global equity market and to earn a consistent premium on top of that return through superior security selection.

1.7.3 Arbitrage, Return Enhancers, and Risk Diversifiers

The concept of arbitrage is an active absolute return strategy. **Pure arbitrage** is the attempt to earn risk-free profits through the simultaneous purchase and sale of identical positions trading at different prices in different markets. Modern finance often

derives pricing relationships based on the idea that the actions of arbitrageurs will force the prices of identical assets toward being equal, such that pure arbitrage opportunities do not exist or at least do not persist. Chapter 6 provides details on arbitrage-free modeling.

The term *arbitrage* is often used to represent efforts to earn superior returns even when risk is not eliminated because the long and short positions are not in identical assets or are not held over the same time intervals. To the extent that investment professionals use the term *arbitrage* more loosely, these investment programs can be said to contain active risk and to generate relative returns.

An obvious goal of virtually any investor is to earn a superior combination of risk and return. If the primary objective of including an investment product in a portfolio is the superior average returns that it is believed to offer, then that product is often referred to as a **return enhancer**. If the primary objective of including the product is the reduction in the portfolio's risk that it is believed to offer through its lack of correlation with the portfolio's other assets, then that product is often referred to as a **return diversifier**.

1.8 OVERVIEW OF THIS BOOK

The CAIA curriculum is organized into two levels, with Level I providing a broad introduction to alternative asset classes and the tools and techniques used to evaluate the risk-return attributes of each asset class. Level II concentrates on the skills and knowledge that a portfolio manager or an asset allocator must possess to manage an institutional-quality portfolio with both traditional and alternative assets.

Thus, Level I focuses on understanding each category of alternative investments and the methods for analyzing each. Level I also provides an introduction to portfolio allocation and management as a foundation for the more advanced treatments covered in Level II. This book has been written with the expectation that readers have a moderate background in traditional investments and quantitative techniques. In some places, a Foundation Check is inserted to alert readers to particular content that is necessary background for the ensuing material. Readers may find the following sources useful in obtaining background information: *Quantitative Investment Analysis* by DeFusco, McLeavey, Pinto, and Runkle (John Wiley & Sons, 2nd edition, 2007) and *Investments* by Bodie, Kane, and Marcus (McGraw-Hill, 10th global edition, 2014).

This book is organized into six parts:

Part 1 introduces foundational material for alternative investments.

Parts 2–5 cover the four categories of alternative investments in the CAIA curriculum by providing extensive introductions to each:

Part 2: Real Assets

Part 3: Hedge Funds

Part 4: Private Equity

Part 5: Structured Products

Part 6 introduces portfolio and risk management concepts central to alternative investments. These concepts are covered from the perspective of both managing a portfolio of alternative investments and adding alternative investments to a portfolio of traditional investments.

REVIEW QUESTIONS

1. Define *investment*.
2. List four major types of real assets other than land and other types of real estate.
3. List the three major types of alternative investments other than real assets in the CAIA curriculum.
4. Name the five structures that differentiate traditional and alternative investments.
5. Which of the five structures that differentiate traditional and alternative investments relates to the taxation of an instrument?
6. Name the four return characteristics that differentiate traditional and alternative investments.
7. Name four major methods of analysis that distinguish alternative investments from traditional investments.
8. Describe an incomplete market.
9. Define *active management*.
10. What distinguishes use of the term *pure arbitrage* from the more general use of the term *arbitrage*?