

Introduction to Alternative Investments

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LEARNING OUTCOMES

Mastery	The candidate should be able to:
<input type="checkbox"/>	a. compare alternative investments with traditional investments;
<input type="checkbox"/>	b. describe hedge funds, private equity, real estate, commodities, infrastructure, and other alternative investments, including, as applicable, strategies, sub-categories, potential benefits and risks, fee structures, and due diligence;
<input type="checkbox"/>	c. describe potential benefits of alternative investments in the context of portfolio management;
<input type="checkbox"/>	d. describe, calculate, and interpret management and incentive fees and net-of-fees returns to hedge funds;
<input type="checkbox"/>	e. describe issues in valuing and calculating returns on hedge funds, private equity, real estate, commodities, and infrastructure;
<input type="checkbox"/>	f. describe risk management of alternative investments.

INTRODUCTION

Assets under management in vehicles classified as alternative investments have grown rapidly since the mid-1990s. This growth has largely occurred because of interest in these investments by institutions, such as endowment and pension funds, as well as by high-net-worth individuals seeking diversification and return opportunities. Alternative investments are perceived to behave differently from traditional investments. Investors may seek either absolute return or relative return.

Some investors hope alternative investments will provide positive returns throughout the economic cycle; this goal is an absolute return objective. Alternative investments are not free of risk, however, and their returns may be negative and/or correlated with other investments, including traditional investments, especially in periods of financial crisis. Some investors in alternative investments have a relative return objective. A relative return objective, which is often the objective of traditional investment portfolios, seeks to achieve a return relative to an equity or fixed-income benchmark.

This reading is organized as follows. Section 2 describes alternative investments' basic characteristics and categories, general strategies of alternative investment portfolio managers, the role of alternative investments in a diversified portfolio, and investment structures used to provide access to alternative investments. Sections 3 through 7 describe features of hedge funds, private equity, real estate, commodities, and infrastructure, respectively, along with issues in calculating returns to and valuation of each.¹ Section 8 briefly describes other alternative investments. Section 9 provides an overview of risk management, including due diligence, of alternative investments. A summary and practice problems conclude the reading.

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ALTERNATIVE INVESTMENTS

“Alternative investments” is a label for a disparate group of investments that are distinguished from long-only, publicly traded investments in stocks, bonds, and cash (often referred to as traditional investments). The terms “traditional” and “alternatives” should not be construed to imply that alternatives are necessarily uncommon or relatively recent additions to the investment universe. Alternative investments include investments in such assets as real estate and commodities, which are arguably two of the oldest investment classes.

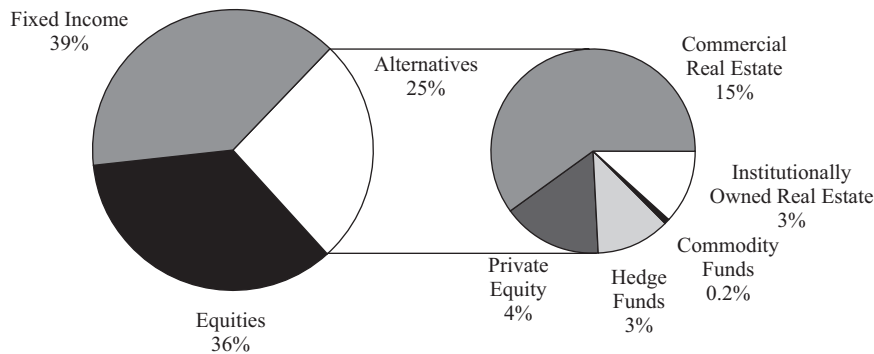
Alternative investments also include non-traditional approaches to investing within special vehicles, such as private equity funds, hedge funds, and some exchange-traded funds (ETFs). These funds may give the manager flexibility to use derivatives and leverage, make investments in illiquid assets, and take short positions. The assets in which these vehicles invest can include traditional assets (stocks, bonds, and cash) as well as other assets. Management of alternative investments is typically active. Passive versions of commodity and real estate investments are also available, but hedge funds, private equity, and infrastructure investments are almost always actively managed. Alternative investments often have many of the following characteristics:

- Narrow manager specialization
- Relatively low correlation of returns with those of traditional investments
- Less regulation and less transparency than traditional investments
- Limited and potentially problematic historical risk and return data
- Unique legal and tax considerations
- High fees
- Concentrated portfolios
- Restrictions on redemptions (i.e., “lockups” and “gates”)

¹ CFA Institute acknowledges the contributions of Michael Underhill of Capital Innovations, LLC, to the section on infrastructure.

Although assets under management (AUM) in alternative investments have grown rapidly, they remain smaller than either fixed-income or equity investable assets, as illustrated in Exhibit 1.

Exhibit 1 Global Assets under Management, December 2014



Sources: Based on data from Boston Consulting Group and DTZ Research.

Alternative investments are not free of risk, and their returns may be correlated with those of other investments, especially in periods of financial crisis. During a long historical period, the average correlation of returns from alternative investments with those of traditional investments may be low, but in any particular period, the correlation can differ from the average. During periods of economic crisis, such as late 2008, correlations among many assets (both alternative and traditional) can increase dramatically.

Investors must be careful in evaluating the historical record of alternative investments because reported return data can be problematic. Further, reported returns and standard deviations are averages and may not be representative of sub-periods within the reported period or future periods. Many investments, such as direct real estate and private equity, are often valued using estimated (appraised) values rather than actual market prices for the subject investments. As a result, the volatility of their returns, as well as the correlation of their returns with the returns of traditional asset classes, will tend to be underestimated. Private equity market returns may be estimated using the technique proposed by Woodward and Hall (2004) to address data problems with historical published indexes, which reflect underlying investments held at cost.² The record of alternative investment universes, such as hedge fund indexes, may be subject to a variety of biases, including survivorship and backfill biases. “Survivorship bias” relates to the inclusion of only current investment funds in a database. As such, the returns of funds that are no longer available in the marketplace (have been liquidated) are excluded from the database. “Backfill bias” occurs when a new fund enters a database and historical returns of that fund are added (i.e., “backfilled”). These biases can lead to returns that are artificially high—causing the index returns to be biased upward. This phenomenon occurs because “survivorship bias” typically results in poorly performing funds being excluded from the database and backfill bias typically results in high-performing funds being added to the database. In addition, different

² This technique involves statistical estimation of quarterly market returns using published fund index and security market index returns.

weightings and constituents in index construction can significantly affect the indexes and their results and comparability. For example, commodity indexes can be weighted heavily in one particular sector, such as oil and gas.

Exhibit 2 shows the historical returns to various investment classes, as well as the standard deviations of the returns, based on selected indexes. The indexes were selected for their breadth and data quality but may not be fully representative of returns to the investment class, and there may be issues with the data. For example, the return to the S&P Global REIT Index may not be representative of returns to equity investment in real estate through private markets (direct ownership of real estate). Private equity and venture capital monthly market-based returns are unavailable, so the returns in Exhibit 2 are modeled using the technique proposed by Woodward and Hall (2004). Hedge fund returns are based on managed fund valuations, not underlying securities prices. The average annual returns and standard deviations are shown for three periods: the 25-year period of Q1 1990–Q4 2014, the period Q4 2007–Q4 2009, and the recent 5-year period of Q1 2010–Q4 2014.

Exhibit 2 Alternative Investment Historical Returns and Volatilities

Index	Q1 1990–Q4 2014		Q4 2007–Q4 2009		Q1 2010–Q4 2014	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
Global stocks	6.9%	16.5%	–10.8%	24.2%	10.7%	15.9%
Global bonds	6.3	5.8	6.7	9.0	2.6	4.8
Hedge funds	7.2	6.0	–4.9	8.0	3.4	4.1
Commodities	2.2	21.8	–15.9	32.1	–5.0	18.1
Real estate	10.4	18.1	–17.6	33.8	15.4	17.7
Private equity	15.4	20.3	–10.0	27.8	20.7	19.4
Venture capital	15.0	47.2	–9.5	29.9	33.6	35.3
One-month Libor	3.42	0.70	1.9	0.5	0.2	0.0

Note: Mean and standard deviation are based on annualized US dollar returns.

Sources: Global stocks = MSCI All Country World Index (ACWI); global bonds = Bloomberg Barclays Global Aggregate Index; hedge funds = Hedge Fund Research, Inc. (HFRI) Fund of Funds Composite Index; commodities = S&P GSCI Commodity Index; real estate = S&P Global REIT Index; private equity is modeled using Cambridge Associates and S&P MidCap indexes; and venture capital is modeled using Cambridge Associates and NASDAQ indexes.

During the 25-year period, the mean returns to hedge funds, real estate, private equity, and venture capital exceeded the mean returns to global stocks and bonds. The average standard deviation of all but hedge funds also exceeded the average standard deviation of global stocks and bonds. Hedge funds appear to have had a higher average return and a lower standard deviation than global stocks for the 25-year period, but this result may be caused, at least partially, by hedge fund indexes' reporting biases. Commodities had the lowest mean return for the 25-year period and a higher standard deviation than all but venture capital. The higher mean returns of alternative investments, except for commodities,³ compared with stocks and bonds may be the result of active managers' exploitation of less efficiently priced assets, illiquidity premiums, and/or account leverage. The higher mean returns may also be the result of tax advantages. For example, real estate investment trusts (REITs) may not be subject to taxes at the fund level if they meet certain conditions.

³ It is important to note that the risk/return profile of "commodities" is heavily influenced by the choice of index. The commonly used S&P GSCI Commodity Index had a high exposure to energy (78.6% in May 2008).

In a poorly performing economy, the use of leverage and investment in illiquid assets may be reasonably expected to lead to poor results. Leveraged investments are more sensitive to market conditions than similar unleveraged investments, and illiquid assets may be difficult to sell and are exposed to high transaction costs during market downturns. From Q4 2007 through Q4 2009, a period categorized as a time of financial crisis, the mean returns to alternative investments other than hedge funds were similar to or even lower than those to global stocks, and the standard deviations exceeded those of global stocks. Alternative investments did not provide the desired protection during the Q4 2007–Q4 2009 period. It is the long-term return potential, however, that attracts many investors, and real estate, private equity, and venture capital performed very well from Q1 2010 through Q4 2014, the five-year period following the financial crisis. During this period, real estate, private equity, and venture capital had average annual returns exceeding the average annual return of global stocks. Also during this period, hedge fund and commodity average annual returns were less than the average annual return of global stocks.

The 2015 annual report for the Yale University Endowment provides one investor's reasoning behind the attractiveness of investing in alternatives:

The heavy [73%] allocation to nontraditional asset classes stems from their return potential and diversifying power. Today's actual and target portfolios have significantly higher expected returns than the 1985 portfolio with similar volatility. Alternative assets, by their very nature, tend to be less efficiently priced than traditional marketable securities, providing an opportunity to exploit market inefficiencies through active management. The Endowment's long time horizon is well suited to exploit illiquid, less efficient markets such as venture capital, leveraged buyouts, oil and gas, timber, and real estate.⁴

The links between this quote and the expected characteristics of alternative investments are clear: diversifying power (low correlations among returns), higher expected returns (positive absolute return), and illiquid and potentially less efficient markets. These links also highlight the importance of having the ability and willingness to take a long-term perspective. Allocating a portion of an endowment portfolio to alternative investments is not unique to Yale. As of August 2015, INSEAD had allocated 38% of its endowment to alternative investments, including real estate, hedge funds, and private equity and debt. The remaining 62% was invested in traditional financial assets, such as global stocks and bonds.⁵ These examples are not meant to imply that every university endowment fund invests in alternative investments, but many do.

High-net-worth investors have also embraced alternative investments. According to the Spectrem Group's 2014 study of American investors, 42% of investors with more than \$25 million in assets have invested in hedge funds and 69% of investors with more than \$125 million have invested in hedge funds. The study's authors noted that wealthy investors were choosing alternatives for higher returns and improved diversification.⁶ The increasing interest in alternative investments by both institutional investors and high-net-worth individuals has resulted in significant growth in each

⁴ https://static1.squarespace.com/static/55db7b87e4b0dca22fba2438/t/58e69e2fd2b857ee-1524caa1/1491508800738/Yale_Endowment_15.pdf (p. 7).

⁵ <https://www.insead.edu/sites/default/files/assets/dept/give/docs/INSEAD-Endowment-Report-2014-2015.pdf>.

⁶ http://spectrem.com/Content_Press/december-3-2014-press-release.

category of alternative investments since the beginning of 2000. The following examples illustrate growth in the categories of private equity, real estate, and commodities in the period up to 2016.

- Global private capital fundraising was approximately \$551 billion in 2015, compared with \$238 billion in 2000.⁷
- Global REITs grew to \$1.7 trillion in market value by 2016. In 1990, the market capitalization of global REITs was less than \$734 billion.⁸
- The number of institutional investors actively investing with commodity trading advisers (CTAs) grew to 1,067 investors in 2015, up from just 331 in 2008.⁹

The enthusiasm for alternative investments was tested during 2008, when assets under management in alternative investments declined as losses were incurred and investors withdrew funds. However, alternative investments continue to represent a significant proportion of the portfolios of pension funds, endowments, foundations, and high-net-worth individuals. By 2012, a resurgence of interest in alternative investments occurred.

EXAMPLE 1

Characteristics of Alternative Investments

Compared with traditional investments, alternative investments are *most likely* to be characterized by high:

- A leverage.
- B liquidity.
- C regulation.

Solution:

A is correct. Alternative investments are likely to use more leverage than traditional investments. Alternative investments are likely to be more illiquid and subject to less regulation compared with traditional investments.

2.1 Categories of Alternative Investments

Considering the variety of characteristics common to many alternative investments, it is not surprising that no consensus exists on a definitive list of these investments. There is even considerable debate as to what represents a category versus a sub-category of alternative investments. For instance, some listings define distressed securities as a separate category, whereas others consider distressed securities a sub-category of the hedge funds and/or private equity categories, or even a subset of high-yield bond investing. Similarly, managed futures are sometimes defined as a separate category and

⁷ “2016 Preqin Global Private Equity & Venture Capital Report.”

⁸ www.cohenandsteers.com/insights/education/about-reits and Ernst & Young, “Global Perspectives: 2016 REIT Report” ([www.ey.com/Publication/vwLUAssets/global-perspectives-2016-reit-report-ey/\\$File/ey-global-perspectives-2016-reit-report.pdf](http://www.ey.com/Publication/vwLUAssets/global-perspectives-2016-reit-report-ey/$File/ey-global-perspectives-2016-reit-report.pdf)).

⁹ <http://docs.preqin.com/reports/Preqin-Special-Report-CTAs-June-2016.pdf>.

sometimes as a sub-category of hedge funds. The following list offers one approach to defining broad categories of alternative investments. Each category is described in detail later in this reading.

- **Hedge funds.** Hedge funds are private investment vehicles that manage portfolios of securities and derivative positions using a variety of strategies. They may use long and short positions and may be highly leveraged, and some aim to deliver investment performance that is independent of broad market performance.
- **Private equity.** Investors can invest in private equity either via direct investment (including co-investment) or indirectly via private equity funds. Private equity funds generally invest in companies (either startup or established) that are not listed on a public exchange, or they invest in public companies with the intent to take them private. The majority of private equity activity involves leveraged buyouts of established profitable and cash-generative companies with solid customer bases, proven products, and high-quality management. **Venture capital**, a specialized form of private equity, typically involves investing in or providing financing to startup or early-stage companies with high growth potential and represents a small portion of the private equity market.
- **Real estate.** Real estate investments may be in buildings and/or land, including timberland and farmland, either directly or indirectly. The growing popularity of securitizations broadened the definition of real estate investing. It now includes private commercial real estate equity (e.g., ownership of an office building), private commercial real estate debt (e.g., directly issued loans or mortgages on commercial property), public real estate equity (e.g., REITs), and public real estate debt investments (e.g., mortgage-backed securities).
- **Commodities.** Commodity investments may be in physical commodity products, such as grains, metals, and crude oil, either through owning cash instruments, using derivative products, or investing in businesses engaged in the production of physical commodities. The main vehicles investors use to gain exposure to commodities are commodity futures contracts and funds benchmarked to commodity indexes. Commodity indexes are typically based on various underlying commodity futures.
- **Infrastructure.** Infrastructure assets are capital-intensive, long-lived, real assets, such as roads, dams, and schools, that are intended for public use and provide essential services. Infrastructure assets may be financed, owned, and operated by governments, but increasingly the private sector is investing in infrastructure assets. An increasingly common approach to infrastructure investing is a public–private partnership (PPP) approach in which governments and investors each have a stake. Investors may gain exposure to these assets directly or indirectly. Indirect investment vehicles include shares of companies, ETFs, private equity funds, listed funds, and unlisted funds that invest in infrastructure.
- **Other.** Other alternative investments include tangible assets (such as fine wine, art, antique furniture and automobiles, stamps, coins, and other collectibles) and intangible assets (such as patents and litigation actions).

2.2 Returns to Alternative Investments

Portfolio managers invest in one of two basic ways to achieve returns: passively or actively. Passive investments focus on index or asset class coverage. Some portfolios of real estate, commodity, and infrastructure instruments may be passively managed to provide exposure to these alternative asset classes. However, alternative investments are generally actively managed.

Investors frequently look to alternative investments for diversification and a chance to earn relatively high returns on a risk-adjusted basis. However, there is a naive attraction to alternative investments based on their expected returns without consideration of their non-typical risks. Risks can be considered both on a standalone basis and within the context of a portfolio and may include low liquidity, limited redemption availability and transparency, and the challenge of manager diversification.

A commonly reported risk ratio is the Sharpe ratio, which equals an investment's return, net of a risk-free rate, divided by its return standard deviation. The Sharpe ratio has shortcomings, however. It equally penalizes upside and downside volatility, fails to capture non-symmetric distributions, and may not fully reflect tails in return distributions. The return distributions to alternative investments are typically non-symmetric and skewed, making the Sharpe ratio a less-than-ideal measure. Other risk measures, such as those that emphasize downside risk, are also frequently considered.¹⁰ A popular downside measure is the Sortino ratio, which uses a numerator similar to that of the Sharpe ratio: mean realized return less target return. If the target return is specified as the risk-free rate of return, the Sortino ratio's numerator is the same as the Sharpe ratio's. The Sortino ratio replaces, in the denominator, the standard deviation of returns with a downside deviation that is the standard deviation of the returns that are below the target return.

Sharpe and Sortino ratios for traditional and alternative investments, based on the same information used in Exhibit 2, are shown in Panel A of Exhibit 3. In calculating the Sortino ratio, the target return was assumed to be 0%.

Other downside risk measures, such as the chance of losing a certain amount of money in a given period, are also used in practice. Panel B of Exhibit 3 includes some other measures indicative of downside risk: the frequencies of monthly returns less than -1%, -5%, and -10% from 1990 through 2014 and, in the right-hand column, the worst return reported in a month.

Exhibit 3

Sharpe Ratios, Sortino Ratios, and Downside Risk Measures, Based on 1990–2014 Returns

Panel A Sharpe and Sortino Ratios (using annualized returns)

Index	Sharpe Ratio	Sortino Ratio
Global stocks	0.21	0.43
Global bonds	0.49	1.09
Hedge funds	0.63	0.74
Commodities	-0.06	0.12

¹⁰ The Sharpe ratio is discussed in greater detail in the reading “Statistical Concepts and Market Returns.” Several other risk measures are used in practice and are discussed throughout the CFA Program curriculum.

Exhibit 3 (Continued)

Index	Sharpe Ratio	Sortino Ratio
Real estate	0.38	0.79
Private equity	0.59	1.19
Venture capital	0.25	0.63

Panel B Downside Frequencies

Index	Frequency of Monthly Return Less Than . . .			Worst Monthly Return
	-1%	-5%	-10%	
Global stocks	32.0%	9.3%	1.7%	-19.8%
Global bonds	14.7	0.0	0.0	-3.8
Hedge funds	12.3	1.0	0.0	-7.5
Commodities	37.7	17.0	5.3	-28.2
Real estate	27.7	7.0	2.3	-30.5
Private equity	29.3	8.7	2.0	-22.3
Venture capital	36.0	23.7	13.7	-40.5

Sharpe ratios (using Libor as a proxy for the risk-free rate) indicate that on the basis of reported data, during the 25-year period from 1990 through 2014, hedge funds offered the best risk–return trade-off and commodities offered the worst. The Sortino ratio, however, using a target return of 0%, indicates that private equity and global bonds offered superior risk–return trade-offs during this period. Global fixed-income investments displayed the most attractive downside risk profile (see Panel B), in part as a result of the bond bull market during this 25-year period. Venture capital had the least attractive downside risk profile, but its higher reported return (see Exhibit 2) resulted in higher Sharpe and Sortino ratios than global stocks and commodities had during the period.

The Sharpe ratio and downside risk measures do not take into account the potentially low level of correlation of alternative investments with traditional investments. A less-than-perfect correlation between investments reduces the standard deviation of a diversified portfolio below the weighted average of the standard deviations of the investments.

2.3 Portfolio Context: Integration of Alternative Investments with Traditional Investments

A key motivation cited for investing in alternative investments is their diversifying potential: Investors perceive an opportunity to improve the risk–return relationship within the portfolio context. Given the historical return, volatility, and correlation profiles of alternative investments, combining a portfolio of alternative investments with a portfolio of traditional investments potentially improves the overall portfolio's

risk–return profile. Adding alternative investments to a portfolio of traditional assets can increase the Sharpe ratio of the overall portfolio owing to potentially higher returns to the portfolio and/or less-than-perfect correlation with traditional investments. In identifying the appropriate allocation to alternative investments, however, an investment manager is likely to consider more than just mean return and average standard deviation of returns. When considering potential portfolio combinations, the manager’s analysis may include historical downside frequencies, worst return in a month for potential portfolio combinations, liquidity considerations.

The purported diversification benefits and improved risk–return contributions of alternative investments to portfolios explain why institutional investors, such as pension funds, may allocate a portion of their portfolios to alternative investments. There are challenges, however, including obtaining reliable measures of risk and return, identifying the appropriate allocation, and selecting portfolio managers. It is important to note that expected diversification benefits from alternative investments are not always realized, including sometimes when they are most needed. Correlations between risky investments increase during periods of market stress and can approach 1.0 during financial crises, as seen in Exhibit 2.

2.4 Investment Structures

A partnership structure is a common structure for many alternative investments, such as hedge funds, infrastructure funds, and private equity funds. In this approach, the fund manager is the **general partner** (GP) and investors are **limited partners** (LPs). Limited partnerships are restricted to investors who are expected to understand and to be able to assume the risks associated with the investments. These types of fund investments, because they are not offered to the general public, are less regulated than offerings to the general public.¹¹ The GP runs the business and theoretically bears unlimited liability for anything that might go wrong.

Limited partners own a fractional interest in the partnership based on their investment amount and according to the terms in the partnership documentation. These partnerships are frequently located in tax-efficient locations, which benefit both the GP and the LPs. Funds set up as private investment partnerships typically have a limit on the number of LPs.¹²

Funds are generally structured with a **management fee** based on assets under management (sometimes called the “base fee”) plus an **incentive fee** (or **performance fee**) based on realized profits. Sometimes, the fee structure specifies that the incentive fee is earned only after the fund achieves a specified return known as a hurdle rate. Fee calculations also take into account a **high-water mark**, which reflects the highest cumulative return used to calculate an incentive fee. In other words, it is the highest value, net of fees, of the fund investment by the individual LP. Note that not all LPs will have the same high-water mark, because it depends on the timing of their individual investment. The use of high-water marks protects clients from paying twice for the same performance.

¹¹ In the United States, the Securities Act of 1933 regulates the process by which investment securities are offered. Most alternative investment funds are structured as “private placements,” which are defined within Regulation D of the Securities Act and are sometimes called “Reg D Offerings.”

¹² Because of the inherent risk involved in alternative investments, investment is typically restricted to a specified number of investors meeting certain criteria. The number and criteria can be specified by regulation or set by the fund.

HEDGE FUNDS

3

In 1949, Alfred Winslow Jones, a sociologist investigating fundamental and technical research to forecast the stock market for *Fortune* magazine, set up an investment fund with himself as GP. The fund followed three key tenets: (1) Always maintain short positions, (2) always use leverage, and (3) charge only an incentive fee of 20% of profits with no fixed fees. Jones called his portfolio a “hedged” fund (eventually shortened to “hedge fund”) because he had short positions to offset his long positions in the stock market. Theoretically, the overall portfolio was hedged against major market moves.

Although Jones’s original three tenets still have some relevance to the hedge fund industry, not all hedge funds maintain short positions and/or use leverage, and most hedge funds have some non-incentive fees. A contemporary hedge fund may have the following characteristics:

- It is an aggressively managed portfolio of investments across asset classes and regions that is leveraged, takes long and short positions, and/or uses derivatives.
- It has a goal of generating high returns, either in an absolute sense or over a specified market benchmark, and it has few, if any, investment restrictions.
- It is set up as a private investment partnership open to a limited number of investors willing and able to make a large initial investment.
- It imposes restrictions on **redemptions**. Investors may be required to keep their money in the hedge fund for a minimum period (referred to as a **lockup period**) before they are allowed to make withdrawals or redeem shares. Investors may be required to give notice of their intent to redeem; the **notice period** is typically 30–90 days in length. Also, investors may be charged a fee to redeem shares.

Funds of hedge funds are funds that hold a portfolio of hedge funds. They create a diversified portfolio of hedge funds accessible to smaller investors or to those who do not have the resources, time, or expertise to choose among hedge fund managers. Also, funds of hedge funds, commonly shortened to “funds of funds,” are assumed to have some expertise in conducting due diligence on hedge funds and may be able to negotiate better redemption terms than individual investors can. Funds of funds invest in numerous hedge funds and may diversify across fund strategies, investment regions, and management styles. The distinction between a single hedge fund and a fund of funds is not necessarily clear-cut because hedge funds can invest in other hedge funds. Each hedge fund into which a fund of funds invests is structured to receive a management fee plus an incentive fee. The fund of funds itself is also structured to receive a management fee and may also receive an incentive fee.

Hedge fund managers are less restricted than traditional investment managers and thus may have the flexibility to invest anywhere they see opportunity. Most hedge funds have broadly stated strategies to allow flexibility. Hedge funds are often given additional latitude to invest a percentage of the AUM, generally less than 20%, without any real limitations. A hedge fund can also be structured as part of one “asset management” business that is “contracted” to manage several different funds in addition to managing money directly (e.g., SuperStar Asset Management might manage SuperStar Credit Fund, SuperStar Commodities Fund, and SuperStar Multi-Strategy Fund).

The growing popularity of hedge funds is illustrated by AUM and net asset flows for the period of 1990 through 2015. Hedge Fund Research, Inc., (HFRI) reports that AUM grew from approximately \$39 billion in 1990 to \$491 billion in 2000 and to \$2.9 trillion in 2015.¹³

¹³ That is, January 2016.

Exhibit 4 compares the returns and a variety of risk and performance measures of the HFRI Fund of Funds Composite Index, the MSCI ACWI, and the Bloomberg Barclays Global Aggregate Index. The HFRI Fund of Funds Composite Index is an equally weighted performance index of funds of hedge funds included in the HFR Database. Hedge fund indexes suffer from issues related to self-reporting, but the HFRI Fund of Funds Composite Index reflects the actual performance of portfolios of hedge funds. This index may show a lower reported return because of the added layer of fees,¹⁴ but it may represent average hedge fund performance more accurately than HFRI's composite index of individual funds.

As shown in Exhibit 4, over the 25-year period, hedge funds had higher returns than stocks and bonds had and a standard deviation almost identical to that of bonds. As a result, the Sharpe ratio for hedge funds appeared to dominate these and other investments (see Exhibit 3) in both return and risk. Note that the returns and volatilities (standard deviations) represent an average and are not representative of any single year. Hedge funds do not appear as attractive as bonds if returns are adjusted for downside deviation, as reflected in the Sortino measures in Exhibit 4. The “worst drawdown,” reflecting the period of largest cumulative negative returns for hedge funds and global equities, occurred during the period that began in 2007 (when each peaked) and ended in 2009.

Exhibit 4 Risk-Return Characteristics of Hedge Funds and Other Investments, 1990–2014

	FOF Hedge	Global Stocks	Global Bonds
Annualized return	7.2%	6.9%	6.3%
Annualized volatility	6.0%	16.5%	5.8%
Sharpe ratio	0.63	0.21	0.49
Sortino ratio	0.74	0.43	1.09
Percentage of positive months	69.3%	61.3%	62.7%
Best month	6.8%	11.9%	6.2%
Worst month	−7.5%	−19.8%	−3.8%
Worst drawdown	−22.2%	−54.6%	−10.1%

Sources: Fund-of-funds (FOF) hedge data are from the HFRI Fund of Funds Composite Index; global stock data are from the MSCI ACWI; global bond data are from the Bloomberg Barclays Global Aggregate Index.

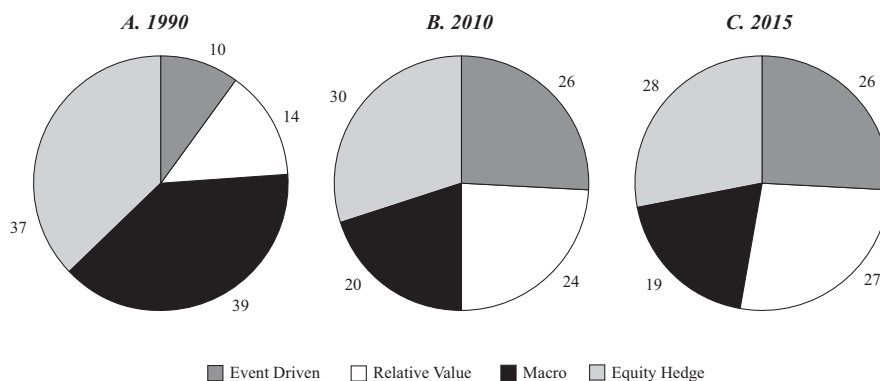
3.1 Hedge Fund Strategies

Hedge funds are typically classified by strategy, although categorizations vary. Many classifying organizations focus on the most common strategies, but others have classification systems based on different criteria, such as the underlying assets in which the funds are invested. Also, classifications change over time as new strategies, often based on new products and opportunities in the market, are introduced. Classifying hedge funds is important so that investors can review aggregate performance data, select strategies to build a portfolio of funds, and select or construct appropriate performance benchmarks. In 2015, HFRI identified four broad categories of strategies:

¹⁴ A fund of funds has an extra layer of fees. Each hedge fund in which a fund of funds invests is structured to receive a management fee plus a performance fee, and the fund of funds itself may also be structured to receive a management fee plus a performance fee.

event driven, relative value, macro, and equity hedge.¹⁵ Exhibit 5 shows the approximate percentage of hedge fund AUM by strategy, according to HFRI, for 1990, 2010, and 2015. Based on percentage of hedge fund AUM by strategy, event-driven and relative value strategies have grown in popularity during the last 25 years, while macro and equity hedge funds have declined in popularity.

Exhibit 5 Percentage of AUM by Strategy



3.1.1 Equity Hedge Strategies

Equity hedge strategies can be thought of as the original hedge fund category. They are focused on public equity markets and take long and short positions in equity and equity derivative securities. Some hedge funds, called “equity-only funds,” invest exclusively in public equity securities. Equity hedge strategies that are not focused on individual equities are categorized generally as event-driven or macro strategies. Equity hedge strategies use a bottom-up, as opposed to top-down, approach. Other investors that are not structured as hedge funds may use some similar strategies. Examples of equity hedge strategies include the following:

- **Market neutral.** These strategies use quantitative (technical) and/or fundamental analysis to identify under- and overvalued equity securities. The hedge fund takes long positions in securities it has identified as undervalued and short positions in securities it has identified as overvalued. The hedge fund tries to maintain a net position that is neutral with respect to market risk as well as other factors (size, industry, etc.). Ideally, the portfolio should have a beta of approximately zero. The intent is to profit from individual securities’ movements while remaining independent from market risk.
- **Fundamental growth.** These strategies use fundamental analysis to identify companies expected to exhibit high growth and capital appreciation. The hedge fund takes long positions in identified companies.
- **Fundamental value.** These strategies use fundamental analysis to identify companies that are undervalued. The hedge fund takes long positions in identified companies. The “deep value” approach takes an extreme, even “distressed,” point of view on its investments.

¹⁵ The Chartered Alternative Investment Analyst (CAIA) Association classifies hedge funds into four broad categories: corporate restructuring, convergence trading, opportunistic, and market directional. These categories approximately coincide with event driven, relative value, macro, and equity hedge, respectively.

- **Quantitative directional.** These strategies use technical analysis to identify companies that are under- and overvalued and to ascertain relationships between securities. The hedge fund takes long positions in securities identified as undervalued and short positions in securities identified as overvalued. The hedge fund typically varies levels of net long or short exposure depending on the anticipated market direction and stage in the market cycle. Similar long–short approaches that are based on fundamental analysis exist.
- **Short bias.** These strategies use quantitative (technical) and/or fundamental analysis to identify overvalued equity securities. Although many funds will have some shorts but maintain a “net long” position (more long positions than short ones), this is the opposite approach, usually with only short positions (though possibly some long hedges to be “net short”). The fund typically varies its net short exposure on the basis of market expectations, looking to go fully short in declining markets.
- **Sector specific.** These strategies exploit manager or structural expertise in a particular sector and use quantitative (technical) and fundamental analysis to identify opportunities in the sector. Technology, biotech/life sciences, and financial services are common investment sectors for these types of hedge funds.

3.1.2 Event-Driven Strategies

Event-driven strategies seek to profit from short-term events, typically involving potential changes in corporate structure, such as an acquisition or restructuring, that are expected to affect individual companies. This strategy is considered “bottom up” (company-level analysis followed by aggregation and analysis of a larger group, such as an industry), as opposed to “top down” (global macro analysis followed by sectoral/regional analysis followed by company analysis). Investments may include long and short positions in common and preferred stocks, as well as debt securities and options. Further subdivisions of this category by HFRI include the following:

- **Merger arbitrage.** Generally, these strategies involve going long (buying) the stock of the company being acquired and going short (selling) the stock of the acquiring company when the merger or acquisition is announced. The manager may expect to profit from the deal spread, which reflects the uncertainty of the deal closing, or may expect the acquirer to ultimately overpay for the acquisition and perhaps suffer from an increased debt load. The primary risk in this strategy is that the announced merger or acquisition does not occur and the hedge fund has not closed its positions on a timely basis.
- **Distressed/restructuring.** These strategies focus on the securities of companies either in bankruptcy or perceived to be near to bankruptcy. Hedge funds attempt to profit from distressed securities in a variety of ways. The hedge fund may simply purchase fixed-income securities trading at a significant discount to par. This transaction takes place in anticipation of the company restructuring and the fund earning a profit from the subsequent sale of the securities. The hedge fund may also use a more complicated approach, for example, buying senior debt and shorting junior debt or buying preferred stock and shorting common stock. These transactions take place in expectation of a profit as the spread between the securities widens. The fund may also short sell the company’s stock, but this transaction involves considerable risk given the potential for loss if the company’s prospects improve.
- **Activist.** The term “activist” is short for “activist shareholder.” These strategies focus on the purchase of sufficient equity in order to influence a company’s policies or direction. For example, the activist hedge fund may advocate for

divestitures, restructuring, capital distributions to shareholders, and/or changes in management and company strategy. These hedge funds are distinct from private equity because they operate primarily in the public equity market.

- **Special situations.** These strategies focus on opportunities in the equity of companies that are currently engaged in restructuring activities other than mergers, acquisitions, or bankruptcy. These activities include security issuance or repurchase, special capital distributions, and asset sales/spinoffs.

3.1.3 *Relative Value Strategies*

Relative value funds seek to profit from a pricing discrepancy (an unusual short-term relationship) between related securities. The expectation is that the pricing discrepancy will be resolved over time. Examples of relative value strategies include the following:

- **Fixed-income convertible arbitrage.** These market-neutral (a theoretical zero-beta portfolio) investment strategies seek to exploit a perceived mispricing between a convertible bond and its component parts (the underlying bond and the embedded stock option). The strategy typically involves buying convertible debt securities and simultaneously selling the same issuer's common stock.
- **Fixed-income asset backed.** These strategies focus on the relative value between a variety of asset-backed securities (ABS) and mortgage-backed securities (MBS) and seek to take advantage of mispricing across different ABS.
- **Fixed-income general.** These strategies focus on the relative value within the fixed-income markets. Strategies may incorporate long/short trades between two corporate issuers, between corporate and government issuers, between different parts of the same issuer's capital structure, or between different parts of an issuer's yield curve. Currency dynamics and government yield curve considerations may also come into play when managing these fixed-income instruments.
- **Volatility.** These strategies typically use options to go long or short market volatility either in a specific asset class or across asset classes. Option prices reflect implied volatility, and an increase in market volatility leads to an increase in option prices. Dynamic hedging with the underlying assets or derivatives is used to offset related risks.
- **Multi-strategy.** These strategies trade relative value within and across asset classes or instruments. Rather than focusing on one type of trade (e.g., convertible arbitrage), a single basis for trade (e.g., volatility), or a particular asset class (e.g., fixed income), this strategy looks for investment opportunities wherever they might exist.

3.1.4 *Macro Strategies*

Macro hedge funds emphasize a top-down approach to identify economic trends evolving across the world. Trades are made on the basis of expected movements in economic variables. Generally, these funds trade opportunistically in the fixed-income, equity, currency, and commodity markets. Macro hedge funds use long and/or short positions to potentially profit from a view on overall market direction as influenced by major economic trends and/or events.

Many hedge funds start as a focused operation, specializing in one strategy or asset class, and, if successful, may diversify over time to become multi-strategy funds. Large multi-strategy funds and funds of funds are similar in offering diversification among hedge fund strategies. With funds of funds, the investor is hiring the fund-of-funds manager to select hedge fund strategies among various fund groups. With multi-strategy funds, the strategies are run within one fund group. A multi-strategy hedge

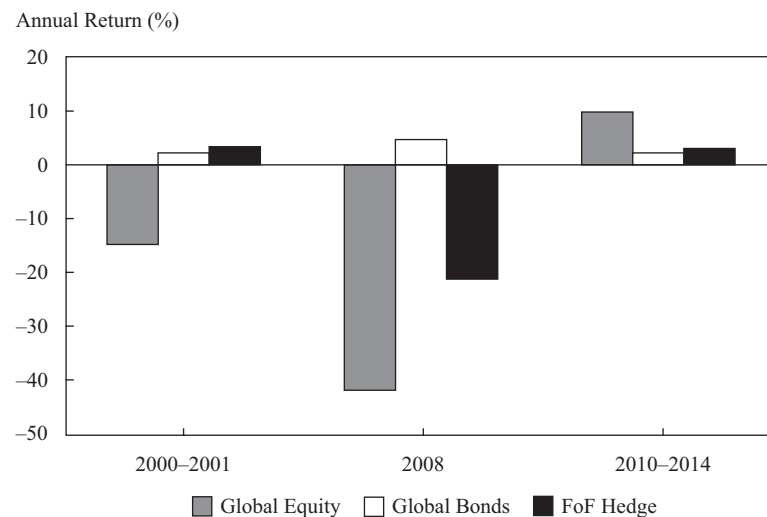
fund does not have the extra layer of fees associated with a fund of funds. However, a fund of funds may offer compensating advantages, such as access by smaller investors, a diversified hedge fund portfolio, better redemption terms, and due diligence expertise.

3.2 Hedge Funds and Diversification Benefits

Given the broad range of strategies across hedge funds, general statements about hedge fund diversification benefits are not necessarily meaningful.

However, the commonly observed less-than-perfect correlation of hedge fund returns with stock market returns does imply some level of diversification benefits. The claim is sometimes made by hedge funds that their performance is uncorrelated, not just less than perfectly correlated, with stock market performance, but overall this claim is unsubstantiated. Looking at Exhibit 6, the claims of lack of correlation with the stock market appear to be supported from 2000 through 2001 but not in 2008 or from 2010 through 2014. During financial crisis periods, the correlation between hedge fund performance and stock market performance may increase. However, the losses for hedge funds in this analysis were less than for the equity markets in 2008.

Exhibit 6 Returns for Hedge Funds, Global Stocks, and Bonds, 2000–2014



3.3 Hedge Fund Fees and Other Considerations

Hedge fund assets under management grew to \$2.9 trillion by the end of 2015 but remain a small percentage of the asset management business overall. Hedge funds, however, earn a significantly higher percentage of fees. For example, according to one estimate for 2013, hedge funds managed less than 3% of total managed funds (hedge funds plus mutual funds) but earned more than 30% of managed fund revenue (fees).¹⁶ Fund revenue depends on fee structure and fund performance.

¹⁶ Estimate prepared by Citigroup Inc. and reported by Bloomberg (29 January 2015).

3.3.1 Fees and Returns

It is important to consider a hedge fund's fee structure prior to making an investment. This fee structure accounts for the disproportionately high revenues earned relative to mutual funds and affects the returns to investors. A common fee structure in the hedge fund market was once "2 and 20," which reflects a 2% management fee and a 20% incentive fee; both fees are paid by LP investors. The average industry fee is now closer to a 1.6% management fee and 17.75% incentive fee.¹⁷ Additionally, funds of hedge funds may charge investors a 1% management fee and a 10% incentive fee. The incentive fee may be calculated on profits net of management fees or on profits before management fees (in other words, the incentive fee is calculated independent of management fees).

Generally, the fee structure specifies that the incentive fee is earned only after the fund achieves a specified return known as a hurdle rate. The hurdle rate is frequently set on the basis of a risk-free rate proxy (e.g., Libor or a specified Treasury bill rate) plus a premium but may be set as an absolute, nominal, or real return target. The incentive fee can be based on returns in excess of the hurdle rate (hard hurdle rate) or on the entire return (soft hurdle rate).

The fee structure may specify that before an incentive fee is paid following a year in which the fund's value has declined, the fund's value must return to a high-water mark. A high-water mark is the highest value reported by the fund for each of its investors net of fees. In other words, high-water marks reflect the highest cumulative return used to calculate an incentive fee. The hedge fund must recover its past losses and return to its high-water mark before any additional incentive fee is earned. Clients are not charged an incentive fee if the latest cumulative return does not exceed the prior high-water mark. This use of a high-water mark protects clients from paying twice for the same performance. Although poorly performing hedge funds may not receive an incentive fee, the management fee is earned irrespective of returns. Given that different clients invest at different times, it is possible that not all clients will be at their respective high-water marks at the same time: A client who invests on a dip will enjoy the fund's recovery and pay an incentive fee, whereas a client who invested at the top will need to earn back what she had lost before having to pay that incentive fee.

Although "2 and 20" and "1 and 10" represent commonly quoted fee structures for hedge funds and funds of hedge funds, respectively, many fee structure variations exist in the marketplace. Hedge funds charge different rates, and different classes of investors may have different fee structures within the same fund. Hedge funds may be willing to negotiate terms, including fees and notice and lockup periods, with potential investors. A fee structure may differ from 2 and 20 on the basis of the promised length of the investment. In other words, the longer investors agree to keep their money in the hedge fund, the lower the fees. A fee structure may also vary from 2 and 20 on the basis of supply and demand as well as historical performance. Sometimes, rebates or reductions in fees are given to investors or to the placement agent who introduces investors to the hedge fund.

The following example demonstrates fee structures and their effect on the resulting returns to investors.

¹⁷ Fees on new funds have declined through the years. HFRI reported in March 2016 that management fees for new funds averaged 1.6% and incentive fees averaged 17.75% in 2015. In 2007, it reported that new fund incentive fees averaged 18.5%.

EXAMPLE 2**Fee and Return Calculations**

AWJ Capital is a hedge fund with \$100 million of initial investment capital. It charges a 2% management fee based on year-end AUM and a 20% incentive fee. In its first year, AWJ Capital has a 30% return. Assume management fees are calculated using end-of-period valuation.

- 1 What are the fees earned by AWJ if the incentive and management fees are calculated independently? What is an investor's effective return given this fee structure?
- 2 What are the fees earned by AWJ assuming that the incentive fee is calculated on the basis of return net of the management fee? What is an investor's net return given this fee structure?
- 3 If the fee structure specifies a hurdle rate of 5% and the incentive fee is based on returns in excess of the hurdle rate, what are the fees earned by AWJ assuming the performance fee is calculated net of the management fee? What is an investor's net return given this fee structure?
- 4 In the second year, the fund value declines to \$110 million. The fee structure is as specified for Question 1 but also includes the use of a high-water mark (computed net of fees). What are the fees earned by AWJ in the second year? What is an investor's net return for the second year given this fee structure?
- 5 In the third year, the fund value increases to \$128 million. The fee structure is as specified in Questions 1 and 4. What are the fees earned by AWJ in the third year? What is an investor's net return for the third year given this fee structure?
- 6 What are the arithmetic and geometric mean annual returns for the three-year period based on the fee structure specified in Questions 1, 4, and 5? What is the capital gain to the investor for the three-year period? What are the total fees paid to AWJ for the three-year period?

Solution to 1:

AWJ fees

$$\$130 \text{ million} \times 2\% = \$2.6 \text{ million management fee}$$

$$(\$130 \text{ million} - \$100 \text{ million}) \times 20\% = \$6 \text{ million incentive fee}$$

$$\text{Total fees to AWJ Capital} = \$8.6 \text{ million}$$

$$\text{Investor return: } (\$130 \text{ million} - \$100 \text{ million} - \$8.6 \text{ million}) / \$100 \text{ million} = 21.40\%$$

Solution to 2:

$$\$130 \text{ million} \times 2\% = \$2.6 \text{ million management fee}$$

$$(\$130 \text{ million} - \$100 \text{ million} - \$2.6 \text{ million}) \times 20\% = \$5.48 \text{ million incentive fee}$$

$$\text{Total fees to AWJ Capital} = \$8.08 \text{ million}$$

$$\text{Investor return: } (\$130 \text{ million} - \$100 \text{ million} - \$8.08 \text{ million}) / \$100 \text{ million} = 21.92\%$$

Solution to 3:

$$\$130 \text{ million} \times 2\% = \$2.6 \text{ million management fee}$$

$(\$130 \text{ million} - \$100 \text{ million} - \$5 \text{ million} - \$2.6 \text{ million}) \times 20\% = \$4.48 \text{ million incentive fee}$

Total fees to AWJ Capital = \$7.08 million

Investor return: $(\$130 \text{ million} - \$100 \text{ million} - \$7.08 \text{ million})/\$100 \text{ million} = 22.92\%$

Solution to 4:

$\$110 \text{ million} \times 2\% = \$2.2 \text{ million management fee}$

No incentive fee because the fund has declined in value.

Total fees to AWJ Capital = \$2.2 million

Investor return: $(\$110 \text{ million} - \$2.2 \text{ million} - \$121.4 \text{ million})/\$121.4 \text{ million} = -11.20\%$

The beginning capital position in the second year for the investors is $(\$130 \text{ million} - \$8.6 \text{ million}) = \$121.4 \text{ million}$. The ending capital position at the end of the second year is $(\$110 \text{ million} - \$2.2 \text{ million}) = \$107.8 \text{ million}$.

Solution to 5:

$\$128 \text{ million} \times 2\% = \$2.56 \text{ million management fee}$

$(\$128 \text{ million} - \$121.4 \text{ million}) \times 20\% = \$1.32 \text{ million incentive fee}$.

The \$121.4 million represents the high-water mark established at the end of Year 1.

Total fees to AWJ Capital = \$3.88 million

Investor return: $(\$128 \text{ million} - \$3.88 \text{ million} - \$107.8 \text{ million})/\$107.8 \text{ million} = 15.14\%$

The ending capital position at the end of Year 3 is \$124.12 million. This amount is the new high-water mark.

Solution to 6:

Arithmetic mean annual return = $(21.4\% - 11.20\% + 15.14\%)/3 = 8.45\%$

Geometric mean annual return = $[\text{Cube root of } (124.12/100)] - 1 = 7.47\%$

Capital gain to the investor = $(\$124.12 \text{ million} - \$100 \text{ million}) = \$24.12 \text{ million}$

Total fees = $(\$8.6 \text{ million} + \$2.2 \text{ million} + \$3.88 \text{ million}) = \14.68 million

As the example illustrates, the return to an LP investor in a fund differs significantly from the return to the fund. Hedge fund indexes generally report performance net of fees. If fee structures vary, however, the net-of-fees returns may vary among investors and from that included in the index. The multilayered fee structure of funds of hedge funds has the effect of further diluting returns to the investor, but this disadvantage can be balanced with several positive features. Funds of hedge funds may provide a diversified portfolio of hedge funds, may provide access to hedge funds that may otherwise be closed to direct investments, and may offer expertise in and conduct due diligence in selecting the individual hedge funds. Fund-of-funds money is considered “fast” money by hedge fund managers because fund-of-funds managers tend to be

the first to redeem their money when hedge funds start to perform poorly,¹⁸ and they may also have negotiated redemption terms that are more favorable (for example, a shorter lockup period and/or notice period).

EXAMPLE 3

Comparison of Returns—Investment Directly into a Hedge Fund or through a Fund of Hedge Funds

An investor is contemplating investing €100 million in either ABC Hedge Fund (ABC HF) or XYZ Fund of Funds (XYZ FOF). XYZ FOF has a “1 and 10” fee structure and invests 10% of its AUM in ABC HF. ABC HF has a standard “2 and 20” fee structure with no hurdle rate. Management fees are calculated on an annual basis on AUM at the beginning of the year. For simplicity, assume that management fees and incentive fees are calculated independently. ABC HF has a 20% return for the year before management and incentive fees.

- 1 Calculate the return to the investor from investing directly in ABC HF.
- 2 Calculate the return to the investor from investing in XYZ FOF. Assume that the other investments in the XYZ FOF portfolio generate the same return before management fees as ABC HF generates and have the same fee structure as ABC HF has.
- 3 Why would the investor choose to invest in a fund of funds instead of a hedge fund given the effect of the “double fee” demonstrated in the answers to Questions 1 and 2?

Solution to 1:

ABC HF has a profit before fees on a €100 million investment of €20 million ($= €100 \text{ million} \times 20\%$). The management fee is €2 million ($= €100 \text{ million} \times 2\%$), and the incentive fee is €4 million ($= €20 \text{ million} \times 20\%$). The return to the investor is 14% ($= [20 - 2 - 4]/100$).

Solution to 2:

XYZ FOF earns a 14% return or €14 million profit after fees on €100 million invested with hedge funds. XYZ FOF charges the investor a management fee of €1 million ($= €100 \text{ million} \times 1\%$) and an incentive fee of €1.4 million ($= €14 \text{ million} \times 10\%$). The return to the investor is 11.6% ($= [14 - 1 - 1.4]/100$).

Solution to 3:

This scenario assumed that returns were the same for all underlying hedge funds. In practice, this result will not likely be the case, and XYZ FOF may provide due diligence expertise and potentially valuable diversification.

The hedge fund business is attractive to portfolio managers because fees can generate significant revenue if the fund performs well and AUM are significant. Many new hedge funds launched in the late 1990s and early 2000s. However, not all hedge funds remain in business long. One study suggests that more than a quarter of all hedge funds fail within the first three years because of performance problems—failure to generate sufficient revenue to cover the fund’s operating costs.¹⁹ This outcome is one

¹⁸ Anecdotal evidence suggests that many funds of funds that cater to high-net-worth investors move money faster than funds of funds that serve institutional clients.

¹⁹ Brooks and Kat (2002).

of the reasons survivorship bias is a major problem in hedge fund indexes. Because of the survivorship and backfill biases, hedge fund indexes may not reflect actual average hedge fund performance but, rather, reflect only the performance of hedge funds that are performing well and thus “survived” in the market place.

3.3.2 Other Considerations

Hedge funds may use leverage to seek higher returns on their investments. Leverage has the effect of magnifying gains or losses because the hedge fund can take a large position relative to the capital committed. Hedge funds leverage their portfolios by borrowing capital from prime brokers and/or using derivatives.

For example, if a hedge fund expects the price of Nestlé SA to increase, it can take a number of actions to benefit from the expected price increase. The fund can buy a thousand shares of Nestlé, buy 10 futures contracts on Nestlé on the NYSE Euronext, buy call options on 1,000 shares of Nestlé, or sell put options on a thousand shares of Nestlé. The profit or loss from holding the futures will be similar to the profit or loss from holding the shares, but the capital requirement for the investment in the futures is far lower. If the hedge fund had bought calls on 1,000 shares of Nestlé, the fund would have paid a relatively small premium and potentially experienced a significant profit if Nestlé had increased in price. The maximum loss to the fund would have been the premium paid. If the hedge fund had sold puts on 1,000 shares of Nestlé in expectation of the price rising and the puts were not exercised, the fund would have a maximum profit equal to the relatively small premium received. If Nestlé had declined in price, however, the potential loss could be extremely large.

Investors, including hedge funds, are required to put up some collateral when using derivatives if they are going to be exposed to potential losses on their positions. This collateral requirement helps protect against default on the position and helps protect the counterparty (or clearinghouse) to the derivative. The amount of collateral depends on the investment’s riskiness as well as the creditworthiness of the hedge fund or other investor. Collateral cannot be otherwise invested in a fund’s strategy and thus may be a drag on performance.

The borrowing of capital often takes the form of buying on margin. By borrowing, a hedge fund can invest a larger amount than was invested in the fund. Hedge funds normally trade through **prime brokers**, which provide services including custody, administration, lending, short borrowing, and trading. A hedge fund will normally negotiate its margin requirements, interest, and fees with its prime broker(s). The hedge fund deposits cash or other collateral into a margin account with the prime broker, and the prime broker essentially lends the hedge fund the shares, bonds, or derivatives to make additional investments. The margin account represents the hedge fund’s net equity in its positions. The minimum margin required depends on the investment’s riskiness and the creditworthiness of the hedge fund.

The smaller the margin requirement, the more leverage is available to the hedge fund. Leverage is a large part of the reason that hedge funds make either larger-than-normal returns or significant losses; the leverage magnifies both gains and losses. If the margin account or the hedge fund’s equity in a position declines below a certain level, the lender initiates a margin call and requests the hedge fund put up more collateral. Inability to meet margin calls can have the effect of magnifying or “locking in” losses because the hedge fund may have to liquidate (close) the losing position. This liquidation can lead to further losses if the order size is sufficiently large to move the security’s market price before the fund can sufficiently eliminate the position.

Another factor that can lock in or magnify losses for hedge funds is investor redemptions. Redemptions frequently occur when a hedge fund is performing poorly. In the hedge fund industry, a **drawdown** is a reduction in net asset value (NAV)²⁰ to below the high-water mark. When drawdowns occur, investors may decide to exit the fund or redeem a portion of their shares. Redemptions may require the hedge fund manager to liquidate some positions and incur transaction costs. As previously mentioned, the reduction or liquidation of a position may further magnify the losses on the position. Funds sometimes charge redemption fees to discourage redemption and to offset the transaction costs for the remaining investors. Notice periods try to allow the hedge fund manager to liquidate a position in an orderly fashion without magnifying the losses. Lockup periods, where investors cannot withdraw their capital, provide the hedge fund manager the required time to implement and potentially realize a strategy's expected results. If the hedge fund experiences a drawdown shortly after a new investment, the lockup period will force these investors to stay in the fund for a period of time rather than be allowed to immediately withdraw. A hedge fund's ability to demand a long lockup period and still raise a significant amount of investment capital depends a great deal on the reputation of either the firm or the hedge fund manager. Funds of hedge funds may offer more redemption flexibility than afforded by direct investment in hedge funds because of special redemption arrangements with the underlying hedge fund managers, maintenance of a cash fund, or access to temporary financing.

Although hedge funds are not subject to extensive regulation globally, oversight has increased. In the United States, hedge funds larger than \$100 million are required to be registered with the Securities and Exchange Commission (SEC). Additional regulation has been established in recent years. Under the Alternative Investment Fund Managers Directive (AIFMD), hedge funds that operate or market themselves in the European Union (EU) must be authorized. The AIFMD was implemented in the EU in 2013, and in the United States, regular submission of the risk disclosure document Form PF to the Financial Stability Oversight Council has been required since 2012. Regulation may not require hedge funds to be transparent to outsiders or proactive in communicating their strategies and reporting their returns.

Offshore jurisdictions (for example, the Cayman Islands) are often the locale for registering hedge funds, whether managed in the United States, Europe, or Asia. However, some hedge funds choose to register domestically. The choice to register in, for example, the United States or the United Kingdom may result from the added credibility of registering with the SEC or the Financial Services Authority, respectively. Sometimes, onshore hedge funds set up complementary offshore funds to attract capital from various investor types and origins.

EXAMPLE 4

Effect of Redemption

A European credit hedge fund has a very short notice period of one week because the fund's managers believe that it invests in highly liquid asset classes and is market neutral. The fund has a small number of holdings that represent a significant portion of the outstanding issues of each holding. The fund's lockup period has expired. Unfortunately, in one particular month, because of the downgrades of two large holdings, the hedge fund has a drawdown (decline in NAV) of more

²⁰ NAV per share is the value of the fund's total assets minus liabilities, divided by the number of shares outstanding.

than 5%. The declines in value of the two holdings result in margin calls from their prime broker, and the drawdown results in requests to redeem 50% of total partnership interests. The combined requests are *most likely* to:

- A** force the hedge fund to liquidate or unwind 50% of its positions in an orderly fashion throughout the week.
- B** have little effect on the prices received when liquidating the positions because the hedge fund has one week before the partnership interests are redeemed.
- C** result in a forced liquidation, which will further drive down prices and result in a bigger drawdown, so that the remaining investors will redeem their partnership interests, leading to fund liquidation and closure.

Solution:

C is correct. One week may not be enough time to unwind such a large portion of the fund's positions in an orderly fashion so that the unwinding does not further drive down prices. A downgrading is not likely to have a temporary effect, so even if other non-losing positions are liquidated to meet the redemption requests, it is unlikely that the two large holdings will return to previous or higher values in short order. Also, the hedge fund may have a week to satisfy the requests for redemptions, but the margin call must be met immediately. Thus, it is common for a large forced liquidation to drive down prices, resulting in further drawdowns and redemption requests, which ultimately risk the fund's existence.

3.4 Hedge Fund Valuation Issues

Valuations are important for calculating performance and meeting redemptions. The frequency with which and how hedge funds are valued vary among funds. Hedge funds are generally valued on a daily, weekly, monthly, or quarterly basis. The valuation may use market or estimated values of underlying positions. When market prices or quotes are used for valuation, funds may differ in which price or quote they use (for example, bid price, ask price, average quote, or median quote). A common practice is to use the average quote: $(\text{Bid} + \text{Ask})/2$. A more conservative and theoretically accurate approach is to use bid prices for longs and ask prices for shorts, because these are more realistic prices at which the positions could be closed.

The underlying positions may be in highly illiquid or non-traded investments, and therefore, it is necessary to estimate values because there are no reliable market values. Estimated values may be computed using statistical models. Any model should be independently tested, benchmarked, and calibrated to industry-accepted standards to ensure consistency of approach. Because of the potential for conflicts of interests affecting estimates of value, hedge funds should develop procedures for in-house valuations, communicate these procedures to clients, and adhere to them.

Liquidity is an important issue for valuation but is particularly so for strategies involving private investments, convertible bonds, collateralized debt obligations, distressed debt, and emerging market securities, which may be relatively illiquid. If a quoted market price is available, the use of liquidity discounts or "haircuts" is actually inconsistent with valuation guidance under most generally accepted accounting standards. Many practitioners, however, believe that liquidity discounts are necessary to reflect fair value. This assumption has resulted in some funds having two NAVs—trading and reporting. The trading NAV incorporates liquidity discounts, based on the size of the position held relative to the total amount outstanding in the issue and its trading volume. The reporting NAV is based on quoted market prices. Again, redemption fees can offset trading costs in illiquid assets for investors that remain in the fund.

EXAMPLE 5**Hedge Fund Valuation**

A hedge fund with a market-neutral strategy restricts its investment universe to domestic publicly traded equity securities that are actively traded. In calculating net asset value, the fund is most likely to use which of the following to value underlying positions?

- A** Average quotes
- B** Average quotes adjusted for liquidity
- C** Bid price for shorts and ask price for longs

Solution:

A is correct. The fund is most likely to use average quotes. The securities are actively traded, so no liquidity adjustment is required. If the fund uses bid–ask prices, it will use ask prices for shorts and bid prices for longs; these are the prices at which the positions are closed.

3.5 Due Diligence for Investing in Hedge Funds

When investing in hedge funds, investors must consider many issues. A basic question is whether one wants to rely on the expertise of a manager of a fund of hedge funds to invest in a portfolio of hedge funds or whether one has the expertise to undertake the hedge fund investment selection process. Funds of hedge funds potentially offer the benefits of providing a diversified portfolio of hedge funds, supplying expertise in conducting due diligence, and negotiating favorable redemption terms. These potential benefits come at the cost of an additional layer of fees. Also, although a fund of hedge funds may provide expertise in due diligence, the investor should still conduct due diligence when choosing a fund of hedge funds.

Investors in hedge funds should consider many factors in their decision-making process. This section highlights some of the key due diligence points to consider but does not provide an exhaustive list of factors. Key factors to consider include investment strategy, investment process, competitive advantage, track record, size and longevity, management style, key person risk, reputation, investor relations, plans for growth, and risk management systems.

Investment strategy and process are challenging to fully assess because hedge funds may limit disclosure in order to maintain their competitive advantage and to not give away information that is considered proprietary. It should be possible, however, to identify in which markets the hedge fund invests, the general investment strategy (for example, long–short, relative arbitrage, and so on), the basic process to implement this strategy, and the benchmark against which the fund gauges its performance.

Track record is a commonly viewed consideration because it should be readily available and is often assumed to be an indicator of future performance and risk (perhaps incorrectly, based on studies of performance persistence).²¹ Investors should determine how the returns are calculated (e.g., based on estimates of value or market prices) and reported (e.g., before or after fees) and how the returns and risks compare with some benchmark. The investor should inquire about the fee structure because, as demonstrated earlier, this information will affect the return to the investor.

²¹ For a discussion of institutional investors' record at selecting managers, see Stewart, Heisler, Knittel, and Neumann (2009).

Size and longevity are also common items for review.²² The older a fund is, the more likely it has not caused significant losses to its investors (otherwise, it is likely to have experienced redemptions, been unable to raise further capital, and thus liquidated). As a result, older funds are likely to have experienced growth in AUM through both capital appreciation and additional investments (capital injections). Many investors require hedge funds to have a minimum track record of two years before they will invest. This requirement makes it particularly difficult for startup funds to raise money because their managers need capital to invest before they can build a track record. In many cases, startup funds receive money from seed investors who want a share of the business for their investment.

A hedge fund's size can be an important consideration for investors because many investors set a minimum size on their investments to justify the time and expense to conduct due diligence, but they also want to ensure that they do not impose business risk by being too large of a percentage of a fund's overall AUM. For example, if one investor represents 50% of the AUM, then the decision of that investor to liquidate his holdings will likely cause a crisis for the hedge fund's existence. Of course, such an investor may be able to negotiate favorable fees or other terms with the manager. Combining these concepts, if an investor's minimum investment size is \$10 million and the investor's fund ownership limit is 10%, the minimum hedge fund size the investor can consider is \$90 million.

The hedge fund due diligence process also focuses on many qualitative factors, including management style, key person risk, reputation, investor relations, and plans for growth. A thorough due diligence process will also include a review of management procedures, including leverage, brokerage, and diversification policies. The use of leverage and counterparty risk can significantly affect a fund's risk and performance. In addition to gathering information about the fund's prime broker and custody arrangements for securities, the investor should identify the auditor of the hedge fund and ensure that the auditor is independent and known for conducting competent audits.

Risk management of systems is an important consideration for reviewing a hedge fund. Relevant risk management questions to ask are varied and related to the type of securities in which the fund invests. Ultimately, the answers should provide to investors confidence that the fund performs risk management in a rigorous fashion. In many cases, particularly with smaller funds or those that invest in more unusual or illiquid assets, the answers to these questions may indicate either that the systems and processes are simplistic or that the answers themselves are very complex. Commonly, hedge fund managers believe that their strategies, systems, and processes are proprietary, and they are unwilling to provide much information to potential investors. This reluctance can make due diligence very challenging. Regulation of hedge funds is likely to continue to increase in the future, which may further help with the due diligence process.

EXAMPLE 6

Due Diligence

HF 1 and HF 2 invest in the same asset class using a similar investment strategy. A potential investor has gathered the following data from the hedge funds:

²² For a discussion of quantitative factors investors use to select investment managers, see Heisler, Knittel, Neumann, and Stewart (2007).

Characteristic	HF 1	HF 2
Annualized returns	15%	10%
Sharpe ratio	1.3	1.6
Size (US\$ millions)	200	500
Fees	1.5 and 15	2 and 20
Track record	2 years	5 years

Based on the information in the table, the investor is *most likely* to:

- A invest in HF 2 because of its higher Sharpe ratio.
- B question how the annualized returns are calculated for each fund (whether net of fees or gross of fees as well as details on the performance fee calculation) before making a decision.
- C invest in HF 1 because of its higher returns and lower fees.

Solution:

B is correct. It is important to know how returns are calculated and whether they are comparable before making any decision. If both returns are reported net of fees, the higher fees on HF 2 may account for most of the difference in returns between the two funds.

4

PRIVATE EQUITY

Private equity refers to investment in privately owned companies or in public companies with the intent to take them private. There are different stages and types of private equity investing. The focus of private equity firms, which may manage many private equity funds, may change over time as business conditions and the availability of financing change. A possible categorization of private equity identifies leveraged buyouts, venture capital, development capital, and distressed investing as primary private equity strategies.

Leveraged buyouts (LBOs) or highly leveraged transactions refer to private equity firms establishing buyout funds (or LBO funds) that acquire public companies or established private companies with a significant percentage of the purchase price financed through debt. The target company's assets typically serve as collateral for the debt, and the target company's cash flows are expected to be sufficient to service the debt. The debt becomes part of the target company's capital structure if the buyout goes through. After the buyout, the target company becomes or remains a privately owned company.

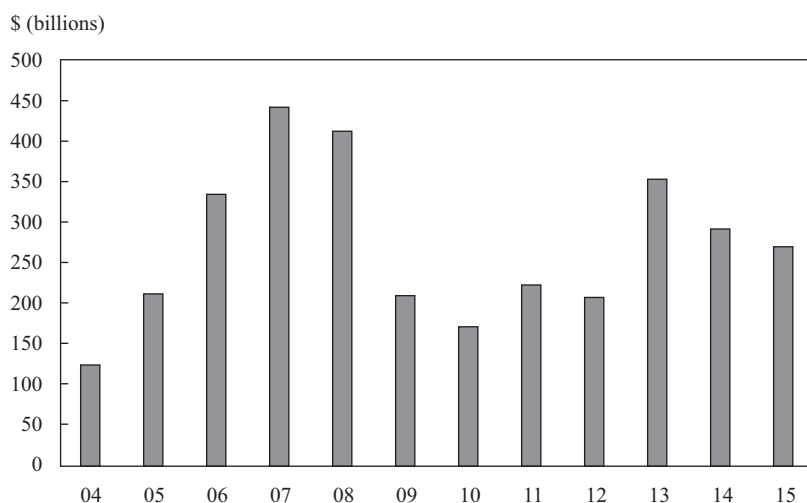
Venture capital entails investing in or providing financing to private companies with high growth potential. Typically, these are startup or young companies, but venture capital can be provided at a variety of stages. In contrast, **development capital** generally refers to minority equity investments in more mature companies that are looking for capital to expand, restructure operations, enter new markets, or finance major acquisitions.

Distressed investing typically entails buying the debt of mature companies experiencing financial difficulty. These companies may be in bankruptcy proceedings, have defaulted on debt, or seem likely to default on debt. Some investors attempt to identify companies with a temporary cash flow problem but a good business plan that will help the company survive and, in the end, flourish. These investors buy the

company's debt in expectation of both the company and its debt increasing in value. Turnaround investors buy debt and plan to be more active in the management and direction of the company. They seek distressed companies to restructure and revive.

The level of activity in private equity has grown over time, but it is cyclical. The cyclical nature is shown visually in Exhibit 7, which displays committed capital raised by funds between 2004 and 2015. Note that detailed information on private equity activity is not always readily available.

Exhibit 7 Committed Capital Raised for Private Equity Funds, 2004–2015



Source: PitchBook, PE Activity, 2014 and 2015.

4.1 Private Equity Structure and Fees

Like hedge funds, private equity funds are typically structured as partnerships in which outside investors are limited partners and the private equity firm, which may manage a number of funds, is the general partner. Most private equity firms charge both a management fee and an incentive fee on a fund basis. The management fees generally range from 1% to 3% of **committed capital**. Committed capital is the amount that the LPs have agreed to provide to the private equity fund. Private equity funds raise committed capital and draw down on those commitments over three to five years when they have a specific investment to make. Until the committed capital is fully drawn down and invested, the management fee is based on committed capital, *not* invested capital. The committed capital basis for management fees is an important distinction from hedge funds, whose management fees are based on AUM. After the committed capital is fully invested, the fees are paid only on the funds remaining in the investment vehicle; as investments are exited, capital is paid back to the investors and investors no longer pay fees on that portion of their investment.

For most private equity funds, the GP does not earn an incentive fee until the LPs have received back their initial investment. The GP typically receives 20% of the total profit, net of any hard hurdle rate, of the private equity fund as an incentive or profit sharing fee.²³ The LPs receive 80% of the total profit of the equity fund plus the return of their initial investment. If distributions are made on the basis of profits earned

²³ The incentive fee may also be calculated on a deal-by-deal basis.

over time rather than upon exit from investments of the fund, the distributions may result in receipts by the GP of more than 20% of the total profit. Most private equity partnership agreements include policies that protect the LPs from this contingency. These policies include prohibiting distributions of incentive fees to the GP until the LPs have received back their invested capital, setting up an escrow account for a portion of the incentive fees, and incorporating a **clawback** provision that requires the GP to return any funds distributed as incentive fees until the LPs have received back their initial investment and 80% of the total profit.

In addition to both management and incentive (profit-sharing) fees, LBO firms may generate income from sources other than the fund's management fees and profit sharing. These income sources include a fee paid to the firm for arranging the buyout of a company, compensation if an intended acquisition falls through, and a fee for arranging for divestitures of assets after the buyout is complete. Private equity firms may also charge consulting fees directly to underlying companies.

4.2 Private Equity Strategies

There are many private equity strategies. A common categorization, as indicated earlier, identifies leveraged buyouts, venture capital, development capital, and distressed investing as the primary strategies, but LBOs and venture capital are the dominant strategies.

4.2.1 Leveraged Buyouts

LBOs are sometimes referred to as “going private” transactions because, after the acquisition of a publicly traded company, the target company's equity is substantially no longer publicly traded. The LBO may also be of a specific type. In **management buyouts** (MBOs), the current management team is involved in the acquisition, and in **management buy-ins** (MBIs), the current management team is being replaced and the acquiring team will be involved in managing the company. LBO managers seek to add value from improving company operations, growing revenue, and ultimately increasing profits and cash flows. The sources of growth in cash flows in order of contribution include organic revenue growth, cost reduction/restructuring, and acquisitions. The potential returns in this category, however, result to a large extent from the use of leverage. If debt financing is unavailable or costly, LBOs are less likely to occur.

4.2.1.1 LBO Financing Debt is central to the structure and feasibility of buyouts in private equity. Target companies are rarely purchased using only the equity of the buyout company. To potentially increase equity returns and increase the number of transactions a particular fund can make, private equity firms use debt to finance a significant proportion of each deal (in other words, they use leverage). For example, in a buyout deal, a private equity firm may invest equity representing 30% of the purchase price and raise the rest of the purchase price in the debt markets. It may use a combination of bank loans—often called “leveraged loans” because of the amount of the company's capital structure they represent—and high-yield bonds.

To protect investors, leveraged loans often carry covenants that may require or restrict certain actions. For instance, the covenants may require the company to maintain specified financial ratios within certain limits, submit information so that the bank can monitor performance, or operate within certain parameters. The covenants may restrict the company from further borrowing (in other words, no additional bonds can be issued and no additional funds can be borrowed from banks or other sources), or they may impose limits on paying dividends or making operating decisions. Similarly, bond terms may include covenants intended to protect the bondholders. One of the key differences between leveraged loans and high-yield bonds, however, is that leveraged loans are generally senior secured debt whereas the bonds are unsecured in the

case of bankruptcy. Even given covenants on the bonds, the bonds issued to finance an LBO are usually high-yield bonds that receive low quality ratings and must offer high coupons to attract investors because of the amount of leverage used.

A typical LBO capital structure includes equity, bank debt (leveraged loans), and high-yield bonds. Leveraged loans often provide a larger amount of capital than either equity or high-yield bonds. As an alternative to high-yield bonds, **mezzanine financing** may also be used.²⁴ Mezzanine financing refers to debt or preferred shares with a relationship to common equity resulting from a feature such as attached warrants or conversion options. Being subordinate to both senior and high-yield debt, mezzanine financing typically pays a higher coupon rate. In addition to interest or dividends, this type of financing offers a potential return based on increases in the value of common equity.

The variety of available financing choices provides flexibility for a target company to match its repayment schedules with expected inflows, and it also permits higher levels of leverage compared with traditional bank debt. The optimal capital structure takes into account a variety of factors, including the company's projected cash flows, investor willingness to purchase different types of debt and accept different levels of leverage, the availability of equity, and the required rates of return for equity and various types of debt considering leverage. The optimal capital structure will be different for every deal.

4.2.1.2 Characteristics of Attractive Target Companies for LBOs Private equity firms invest in companies across many sectors, although an individual firm may specialize in a certain sector or sectors. Whatever the targeted sector(s), private equity firms look for several characteristics, any one of which may make a company particularly attractive as an LBO target. The characteristics include the following:

- **Undervalued/depressed stock price.** The private equity firm perceives the company's intrinsic value to exceed its market price. Private equity firms are, therefore, willing to pay a premium to the market price to secure shareholder approval. Firms try to buy assets or companies cheaply, and they may focus on companies that are out of favor in the public markets and have stock prices that reflect this perception.
- **Willing management and shareholders.** Existing management is looking for a deal. Management may have identified opportunities but does not have access to the resources to make substantial investments in new processes, personnel, equipment, and so on, to drive long-term growth. Current shareholders may have insufficient access to capital and welcome a private equity partner. Family business owners may want to cash out. Private equity firms can provide management and owners with the time and capital to expand a company or turn it around.
- **Inefficient companies.** Private equity firms seek to generate attractive returns on equity by creating value in the companies they buy. They achieve this goal by identifying companies that are inefficiently managed and that have the potential to perform well if managed better.
- **Strong and sustainable cash flow.** Companies that generate strong cash flow are attractive because in an LBO transaction, the target company will be taking on a significant portion of debt. Cash flow is necessary to make interest payments on the increased debt load.

²⁴ This type of loan is referred to as *mezzanine financing* because of its location on the balance sheet and is a *type* of financing.

- **Low leverage.** Private equity firms focus on target companies that currently have no significant debt on their balance sheets. This characteristic makes it easier to use debt to finance a large portion of the purchase price.
- **Assets.** Private equity managers like companies that have a significant amount of unencumbered physical assets. These physical assets can be used as security, and secured debt is cheaper than unsecured debt.

4.2.2 Venture Capital

Venture capital (VC) is often categorized by the stage at which the company of interest (the portfolio company) receives it. The company in which a private equity firm is investing is often called the **portfolio company** because it will become part of the fund's portfolio. The VC stages range from inception of an idea for a company to the point when the company is about to make an IPO (initial public offering) or be acquired. The investment return required varies on the basis of the company's stage of development. Investors in early-stage companies will demand higher expected returns relative to later-stage investors, because the earlier the stage of development, the higher the risk. The ultimate returns realized depend on the portfolio company's success in transitioning from a startup to a going and growing concern.

Venture capitalists, like all private equity managers, are not passive investors. They are actively involved with the companies in which they invest. A VC fund typically receives an equity interest in the company in which it is investing. A VC fund may also provide some debt financing.

- 1 *Formative-stage financing* occurs when the company is still in the process of being formed and encompasses several financing steps, described as follows:
 - a *Angel investing* is capital provided at the idea stage. Funds may be used to transform the idea into a business plan and to assess market potential. The amount of financing at this stage is typically small and provided by individuals (often friends and family) rather than by VC funds.
 - b *Seed-stage financing* or seed capital generally supports product development and/or marketing efforts, including market research. This point is generally the first stage at which VC funds invest.
 - c *Early-stage financing* (early-stage VC) is provided to companies moving toward operation but before commercial production and sales have occurred. Early-stage financing may be provided to initiate commercial production and sales.
- 2 *Later-stage financing* (expansion VC) is provided after commercial production and sales have begun but before any IPO. Funds may be used for initial expansion of a company already producing and selling a product or for major expansion, such as physical plant expansion, product improvement, or a major marketing campaign.
- 3 *Mezzanine-stage financing*²⁵ (mezzanine venture capital) is provided to prepare a company to go public. It represents the bridge financing needed to fund a private firm until it can complete an IPO or be sold.

Formative-stage financing generally is done via ordinary or convertible preferred share sales to the investor(s) (VC fund), and management retains control of the company. Later-stage financing generally involves management selling control of the company to the VC investor; financing is provided through equity and debt (the fund

²⁵ The term "mezzanine-stage financing" is used because this financing is provided at the stage between being a private and a public company. The focus is on *when* the financing occurs.

may also use convertible bonds or convertible preferred shares). The debt financing is not intended for income generation to the VC fund; rather, it is for the recovery and control of assets in a bankruptcy situation. Simply put, debt financing provides more protection to the VC fund than equity does.

To make an investment, a venture capitalist needs to be convinced that the portfolio company's management team is competent and has a solid business plan with strong prospects for growth and development. Because these investments are not in mature businesses with years of operational and financial performance history, the uncertainty involved with VC investing pertains to accurately estimating company valuation based on future prospects. This estimation is more of an unknown than in LBO investing, which targets mature, underperforming public companies. As the portfolio company matures and moves into later-stage financing, the level of certainty around valuation increases but usually remains less than it is with an LBO investment.

4.2.3 Other Private Equity Strategies

There are several other specialties for private equity firms. These specialties include development capital, also called "minority equity investing," which earns profits from funding business growth or restructuring. Many times, minority equity investing is initiated and sought by management, which is interested in realizing earnings from selling a portion of its shares before the company can go public. Although this scenario occurs most commonly with private companies, publicly quoted companies sometimes seek private equity capital in opportunities called PIPEs (private investment in public equities).

Other private equity strategies may involve providing specific financing (for example, mezzanine funds) or investing in companies in specific industries. As the financial environment changes and evolves, additional strategies may emerge.

4.2.4 Exit Strategies

The ultimate goal for private equity is to improve new or underperforming businesses and exit them at higher valuations. Private equity firms buy and hold companies for an average of five years. The time to exit, however, can range from less than six months to more than 10 years. Before deciding on an exit strategy, private equity managers take into account the dynamics of the industry in which the portfolio company competes, overall economic cycles, interest rates, and company performance.

The following are common exit strategies pursued by private equity portfolio managers:

- **Trade sale.** This strategy refers to the sale of a company to a strategic buyer, such as a competitor. A trade sale can be conducted through an auction process or by private negotiation. Benefits of a trade sale include (a) an immediate cash exit for the private equity fund, (b) potential for high valuation of the asset because strategic buyers may be willing and able to pay more than other potential buyers as a result of anticipated synergies, (c) fast and simple execution, (d) lower transaction costs than an IPO, and (e) lower levels of disclosure and higher confidentiality than an IPO because the private equity firm is generally dealing with only one other party. Disadvantages of trade sales include (a) possible opposition by management, (b) lower attractiveness to employees of the portfolio company than an IPO, (c) a limited number of potential trade buyers, and (d) a possible lower price than in an IPO.
- **IPO.** This approach involves the portfolio company selling its shares, including some or all of those held by the private equity firm, to public investors through an IPO. Advantages for an IPO exit include (a) potential for the highest price; (b) management approval, because management will be retained; (c) publicity for the private equity firm; and (d) potential ability to retain future upside

potential, because the private equity firm may choose to remain a large shareholder. Disadvantages for an IPO exit include (a) high transaction costs paid to investment banks and lawyers; (b) long lead times; (c) risk of stock market volatility; (d) high disclosure requirements; (e) a potential lockup period, which requires the private equity firm to retain an equity position for a specified period after the IPO; and (f) the fact that an IPO is usually appropriate only for larger companies with attractive growth profiles.

- **Recapitalization.** Recapitalization occurs when the private equity firm increases leverage or introduces it to the company and pays itself a dividend. A recapitalization is not a true exit strategy, because the private equity firm typically maintains control; however, it does allow the private equity investor to extract money from the company and pay its investors. A recapitalization may be a prelude to a later exit.
- **Secondary sales.** This approach represents a sale of the company to another private equity firm or another group of investors.
- **Write-off/liquidation.** A write-off occurs when a transaction has not gone well and the private equity firm is updating its value of the investment or liquidating the portfolio company to move on to other projects.

The foregoing exit strategies may be pursued individually, combined together, or used for a partial exit strategy. For example, it is not unusual to see a private equity fund sell a portion of a portfolio company to a competitor via a trade sale and then complete a secondary sale to another private equity firm for the remaining portion. Company shares may also be distributed to fund investors, although such a move is unusual.

4.3 Private Equity: Diversification Benefits, Performance, and Risk

Private equity funds may provide higher return opportunities relative to traditional investments through their ability to invest in private companies, their influence on portfolio companies' management and operations, and their use of leverage. Investments in private equity funds can add diversity to a portfolio composed of publicly traded stocks and bonds because they may have less-than-perfect correlation with those investments.

Exhibit 8 shows the mean annual returns for the Cambridge Associates US Private Equity Index, the NASDAQ and S&P 500 indexes, and the Cambridge Associates mPME (Modified Public Market Equivalent) S&P 500 Index for a variety of periods ending 31 December 2014. Public market equivalent (PME) index returns use internal rate of return (IRR) calculations to simulate investment of private equity cash flows in a market index, such as the S&P 500. The technique involves recording the timing of cash flows for the fund and computing period returns, assuming the flows are invested in a market index instead of the fund. The returns in Exhibit 8 show that US private equity funds, based on the Cambridge Associates' estimates, on average outperformed stocks, based on the NASDAQ and S&P 500 indexes, only in the 10- and 20-year periods ending 31 December 2014. The returns to US private equity underperformed these indexes' returns for the one- and three-year periods and were similar for the five-year period ending 31 December 2014. The mPME index returns were more similar to the S&P 500 returns than to returns on private equity.

Exhibit 8 Comparison of Mean Annual Returns for US Private Equity, US Stocks, and a PME Index

	1 Year	3 Years	5 Years	10 Years	20 Years
US Private Equity ^a	11.3	15.6	15.8	12.9	13.5
NASDAQ	13.4	22.1	15.9	8.1	9.6
S&P 500	13.7	20.4	15.5	7.7	9.9
mPME S&P 500 ^b	13.6	20.5	15.5	8.7	8.7

^a Private equity returns are net of expenses; US stocks and the mPME index are gross.

^b Cambridge Associates mPME.

Source: US Private Equity Index and selected benchmark statistics, 31 December 2014, Cambridge Associates.

Published private equity indexes may be an unreliable measure of performance, however, because of challenges in measuring the historical performance of private equity investing. As with hedge funds, private equity return indexes rely on self-reporting and are subject to survivorship, backfill, and other biases. These characteristics typically lead to overstatement of published returns. Moreover, prior to 2009, in the absence of a liquidity event, private equity firms did not necessarily mark their investments to market. This failure to mark to market leads to understatement of measures of volatility and correlations with other investments. Thus, data adjustments are required to more reliably measure the benefits of private equity investing.

Exhibit 9 lists annualized standard deviations of published quarterly and annual returns of private equity investments from 1990 through 2014. The volatility calculated using published quarterly returns reflects few liquidity events and results in much lower volatility estimates than using annual returns does. Note that the difference between the two measures (quarterly and annual) using the MSCI World Index is insignificant because the stocks in the index are marked to market regularly. In July 2009, private equity firms began reporting investments at their estimated fair values; these estimates are frequently based on market multiples. This change in valuation methodology is reflected in the new International Private Equity and Venture Capital Valuation Guidelines.²⁶

Exhibit 9 Annualized Standard Deviations of Returns to Private Equity Investments, 1990–2014

	Quarterly	Annual
Venture capital*	22.3	54.5
Private equity*	12.8	21.1
MSCI World	17.1	18.4

* Cambridge Associates, LLC, January 1990–December 2014.

According to the historical standard deviations of annual returns shown in Exhibit 9, private equity investments, including venture capital, are riskier than investing in common stocks. Investors should require a higher return from accepting a higher risk, including illiquidity and leverage risks.

²⁶ Interestingly, based on the calculations of author Scott Stewart, data since July 2009 are inconsistent with improvements in marking to market.

Even given its higher risk, private equity, including venture capital investing, may provide benefits to a diversified portfolio. If investors believe they can identify skillful private equity fund managers (managers who can identify attractive portfolio companies and invest in them at reasonable valuations, as well as improve their operations and profitability), they may benefit from superior returns (returns in excess of those expected given the additional leverage, market, and liquidity risks). Kaplan and Schoar (2005) found significant differences in the returns to the top quartile of funds compared with the bottom quartile of funds; the cash flow IRR was 22% a year for the top quartile, compared with 3% a year for the bottom quartile, from 1980 through 2001. Further, Kaplan and Schoar found evidence of performance persistence. Identifying top-performing funds appears to be critical.²⁷

4.4 Portfolio Company Valuation

In order to identify and invest in attractive portfolio companies, private equity professionals must be able to value those companies. Three common approaches are used in the private equity industry to value a company: market or comparables, discounted cash flow (DCF), and asset based. Which approaches are favored depend in part on the portfolio company's industry, and it is common for funds to use more than one approach to arrive at a value.

A market or comparables approach values a company or its equity using multiples of different financial measures. For example, an earnings before interest, taxes, depreciation, and amortization (EBITDA) multiple is commonly used in valuing large, mature private companies that are capital intensive and leveraged. The EBITDA multiple may be determined by looking at the market value of equity plus debt (enterprise value) of a similar publicly traded company or the price recently paid for a comparable business, divided by EBITDA. For other types of companies, multiples based on net income or revenue may be more appropriate. Net income and revenue multiples may be based on the multiples from transactions in comparable companies but are frequently based on heuristics.²⁸

EXAMPLE 7

Portfolio Company Valuation

A private equity fund is considering purchasing a radio broadcaster that had an EBITDA of \$200 million. In the past year, three radio broadcasting companies were sold for $8 \times$ EBITDA, $10 \times$ EBITDA, and $9 \times$ EBITDA. Based on this information, the maximum value the private equity fund is most likely to assign to the broadcaster is:

- A \$1,600 million.
- B \$1,800 million.
- C \$2,000 million.

²⁷ See the CFA Institute Research Foundation's 2013 monograph *Manager Selection* for information on selecting skillful alternative investment managers.

²⁸ Heuristics are mental shortcuts based on experience and knowledge that simplify decision making. They are sometimes called "rules of thumb."

Solution:

C is correct. The maximum value the private equity fund is most likely to assign is that using the highest multiple ($10 \times \$200 \text{ million} = \$2,000 \text{ million}$). The minimum value the seller may be willing to accept is that using the lowest multiple. In negotiations, growth prospects, risk, size, current market conditions, and so on, will likely be considered.

A DCF approach values a company or its equity as the present value of the relevant expected future cash flows. Future free cash flow projections may be discounted to compute a present value for the portfolio company or its equity. Free cash flow to the firm discounted at the weighted average cost of capital may be used to estimate the company's value. Free cash flow to equity discounted at the cost of equity may be used to estimate the value of the company's equity. One simple approach takes a measure such as income or cash flow and divides it by a capitalization rate to arrive at a value estimate. This approach is conceptually different but practically similar to using an income- or cash-based multiple. If the value estimated using a DCF approach is higher than the investment's current price, the opportunity may be an attractive one.

An asset-based approach values a company using the values of its underlying assets less the value of any related liabilities. The approach assumes that a company's value equals the sum of the values of the company's assets minus its liabilities. The valuations can be arrived at using market (fair) values or other values, such as liquidation values. Fair values assume an orderly transaction, whereas liquidation values assume a distressed transaction. In a weak economic environment, liquidation values will most likely be far lower than the immediately previous fair values because there will tend to be many assets for sale and fewer potential buyers.

4.5 Private Equity: Investment Considerations and Due Diligence

Current and anticipated economic conditions, including interest rate and capital availability expectations, are critical factors to consider when evaluating an investment in private equity. Refinancing risk must also be evaluated. If refinancing becomes unavailable, a lack of financing can result in default. The extent to which there is undrawn but committed capital can also affect the private equity sector and the returns to investors.

Investing in private equity firms requires patience. Investors who are comfortable with long-term commitment of funds and illiquidity are best suited to considering private equity investing. Private equity typically requires a long-term commitment by an LP because of the long time lag between investments in and exits from portfolio companies. Once a commitment has been made and an investor becomes an LP, the investor has very limited liquidity choices. Because illiquidity can cause cash flow risks for investors, there should be a liquidity risk premium.

Assuming these characteristics are acceptable, the investor must consider the choice of GP. In this regard, many of the due diligence questions for hedge fund selection are relevant for private equity. Some of the important issues to investigate are the GP's experience and knowledge—financial and operating—the valuation methodology used, the alignment of the GP's incentives with the LPs' interests, the plan to draw on committed capital, and the planned exit strategies.

5

REAL ESTATE

Real estate investing is typically thought of as either direct or indirect ownership (equity investing) in real estate property, such as land and buildings. However, it also includes lending (debt investing) against real estate property—for example, providing a mortgage loan or purchasing mortgage-backed securities (MBS), with the property generally serving as collateral.

Key reasons for investing in real estate include the following:

- Potential for competitive long-term total returns driven by both income generation and capital appreciation
- Prospect that multiple-year leases with fixed rents for some property types may lessen cash flow effects from economic shocks
- Likelihood that less-than-perfect correlation with other asset classes may provide diversification benefits
- Potential to provide an inflation hedge if rents can be adjusted quickly for inflation

Real estate property ownership is represented by a title and may reflect access to air rights, mineral rights, and surface rights, in addition to the rights of use of buildings and land. Titles can be purchased, leased, sold, mortgaged, or transferred together or separately, in whole or in part. Much real estate is residential, but if it is owned with the intention to let, lease, or rent it in order to generate income, it is classified as commercial (i.e., income-producing) real estate. In addition to residential real estate classified as commercial, commercial real estate includes other types of real estate properties, such as office and retail properties.

Institutional ownership of commercial property totaled close to \$2.5 trillion as of 2014, as shown in Exhibit 10, up from \$2.1 trillion in 2008.

Exhibit 10 Institutionally Owned Global Real Estate Property AUM, 2014 (US\$ millions)

Europe	922,064
North America	1,244,464
Australasia	102,672
Asia	136,896
Latin America	23,808
Other	50,096
Total	2,480,000

Source: Based on data from Property Funds Research.

Real estate property exhibits unique features compared with other investment asset classes. The basic indivisibility, unique characteristics (i.e., no two properties are identical), and fixed location of real estate property have implications for investors. For example, the size of investment may have to be large (indivisible), and the investment may be relatively illiquid. Also, real estate property typically requires operational management. Real estate is often subject to wide-ranging government regulations affecting what can be done to modify the existing land or property and to whom and how ownership can be transferred, in addition to other restrictions. Local or regional markets and real estate property values can be independent of countrywide or global

price movements, because local factors may override wider market trends. Cross-border investment in real estate is increasingly common and requires knowledge of country, regional, and local markets.

5.1 Forms of Real Estate Investment

Real estate investing may take a variety of forms. Real estate investments may be classified along two dimensions: (1) debt or equity based and (2) in private or public markets. Equity investments in real estate that occur in the private markets often conclude as direct investments in real estate. The investment capital required to finance real estate property purchases comes from either debt financing or equity financing. A well-known form of debt financing of real estate purchases is mortgages. Private investors—institutional and individual—real estate corporations, and REITs may provide the equity financing for the purchase.

REITs are publicly traded shares of a portfolio of properties. Similarly, mortgages may be packaged and securitized into asset-backed securitized debt obligations (i.e., MBS) that represent rights to receive cash flows from portfolios of mortgage loans. Exhibit 11 shows some examples of the basic forms of real estate investments.

Exhibit 11 Basic Forms of Real Estate Investments and Examples

	Debt	Equity
Private	<ul style="list-style-type: none"> ■ Mortgages ■ Construction lending 	<ul style="list-style-type: none"> ■ Direct ownership of real estate: Ownership can be through sole ownership, joint ventures, or real estate limited partnerships. ■ Indirect ownership via real estate funds
Public	<ul style="list-style-type: none"> ■ MBS (residential and commercial) ■ Collateralized mortgage obligations 	<ul style="list-style-type: none"> ■ Shares in real estate development corporations ■ Shares of REITs

Within the basic forms, there can be many variations.

- Direct ownership can be free and clear, whereby the title to the property is transferred to the owner unencumbered by any financing lien, such as from a mortgage. Initial purchase costs associated with direct ownership may include legal expenses, survey costs, engineering/environmental studies, and valuation (appraisal) fees. In addition, ongoing maintenance and refurbishment charges are also incurred. The property must be managed, which has related costs. The owner may manage the property or may employ a local managing agent.
- Leveraged ownership occurs when the property title is obtained through an equity purchase combined with debt (mortgage financing). In addition to the initial purchase costs, there are mortgage arrangement fees. A mortgage is secured by the property, and in the event of a breach of lending terms, the creditor can petition for the title. Any appreciation (depreciation) of the property's value plus the net operating income in excess of the debt servicing costs provides investors with a leveraged gain (loss) on their equity.

- Financing provided to leveraged owners is frequently in the form of standalone mortgage loans. These loans represent passive investments in which the lender expects to receive a predefined stream of payments throughout the finite life of the mortgage. The loan may become a form of property ownership if the borrower defaults. Investments may be in the form of “whole” loans based on specific properties (typically, direct investment through private markets) or through participation in a pool of mortgage loans (typically, indirect investment in real estate through publicly traded securities, such as MBS).
- Real estate equity investors may use different types of pooled vehicles arranged by an intermediary. These vehicles include the following:
 - Real estate limited partnerships offer exposure to real estate projects while preserving limited liability (up to the amount of the initial investment) and leaving management and liability to GPs who specialize in real estate management.
 - Publicly traded shares of a pool of properties in a special trust (i.e., REITs): REITs invest in various types of real estate and provide retail investors with access to a diversified real estate property portfolio and professional management. REITs are typically required to distribute most of their taxable income to their shareholders.
- Securitization of residential and commercial mortgages provides institutional investors with access to a diversified portfolio of mortgages and allows the original lenders to alter their portfolio of investments. Mortgages are combined into a pool, which is then divided by investment banks into sections called “tranches.” The tranches, having different payment characteristics and credit ratings, are then sold to investors. These securities are generally not considered alternative investments but are held as part of a fixed-income (or credit) portfolio.

REITs and partnerships have fees for managing the assets embedded in their valuations. Fee structures for real estate investment funds can be similar to those for private equity funds, with investment management fees based on either committed capital or invested capital. These fees typically range from 1% to 2% of capital per annum. Funds also charge performance-based fees, similar to a private equity fund.

5.2 Real Estate Investment Categories

The majority of real estate property may be classified as either commercial or residential. In this reading, residential properties are defined narrowly to include only owner-occupied single residences (often referred to as “single-family residential property”). Residential properties owned with the intention to let, lease, or rent them are classified as commercial. Commercial properties also include office, retail, industrial and warehouse, and hospitality (e.g., hotel and motel) properties. Commercial properties may also have mixed uses. Commercial properties generate returns from income (e.g., rent) and capital appreciation. Several factors will affect opportunities for capital appreciation, including development strategies, market conditions, and property-specific features.

5.2.1 Residential Property

For many individuals and families, real estate investment takes the form of direct equity investment (i.e., ownership) in a residence with the intent to occupy.²⁹ In other words, a home is purchased. Given the price of homes, most purchasers cannot pay 100% cash up front and must borrow funds to make the purchase. Any appreciation (depreciation) in the value of the home increases (decreases) the owner's equity in the home and is magnified by any mortgage leverage.

Financial institutions are the main providers (originators) of debt financing (typically, through mortgages) for homeownership. The originators of single-family residential mortgages are making a direct debt investment in the home. Before offering a mortgage, the due diligence process should include the following:

- ensuring that the borrower is making an appropriate equity investment in the home (in other words, paying an adequate proportion of the purchase price),
- conducting a credit review of the borrower,
- establishing that the borrower has sufficient cash flows to make the required payments on the mortgage and to maintain the home,
- appraising (estimating the value of) the home, and
- ensuring that adequate and appropriate insurance is in place on the home and, in some cases, on the borrower.

Home loans may be held on the originator's balance sheet or securitized and offered to the financial markets. Securitization provides indirect debt investment opportunities in residential property via securitized debt products, such as residential mortgage-backed securities (RMBS), to other investors.

5.2.2 Commercial Real Estate

Commercial property has traditionally been considered an appropriate direct investment—equity and debt—for institutional funds or high-net-worth individuals with long time horizons and limited liquidity needs. This perception of appropriateness for only certain types of investors was primarily the result of the complexity of the investments, the large investments required, and the relative illiquidity of the investments. Direct equity investing (i.e., ownership) is further complicated because commercial property requires active day-to-day management. The success of the equity investment is a function of a variety of factors, including how well the property is managed, general economic and specific real estate market conditions, and the extent and terms of any debt financing.

In order to provide direct debt financing, the lender (investor) will conduct financial analyses to establish the borrower's creditworthiness, to ensure that the property will generate cash flows sufficient to service the debt, to estimate the value of the property, and to evaluate economic conditions. The estimate of the property value is critical because the relative size of the loan to the property value (loan-to-value ratio) determines the amount of risk that is held by the lender versus the borrower (equity holder). The borrower's equity in the property is an indicator of commitment to the success of the project and provides a cushion to the lender because the property is generally the sole collateral for the loan.

²⁹ Residential properties (single or multi-family) are considered commercial property if they are maintained as rental properties.

5.2.3 REIT Investing

REITs are listed on stock exchanges in more than 35 countries, and their combined market capitalization exceeded \$1.1 trillion in 2016.³⁰ The risk and return characteristics of REITs depend on the type of investment they make. Mortgage REITs, which invest primarily in mortgages, are similar to fixed-income investments. Equity REITs, which invest primarily in commercial or residential properties and use leverage, are similar to direct equity investments in leveraged real estate.

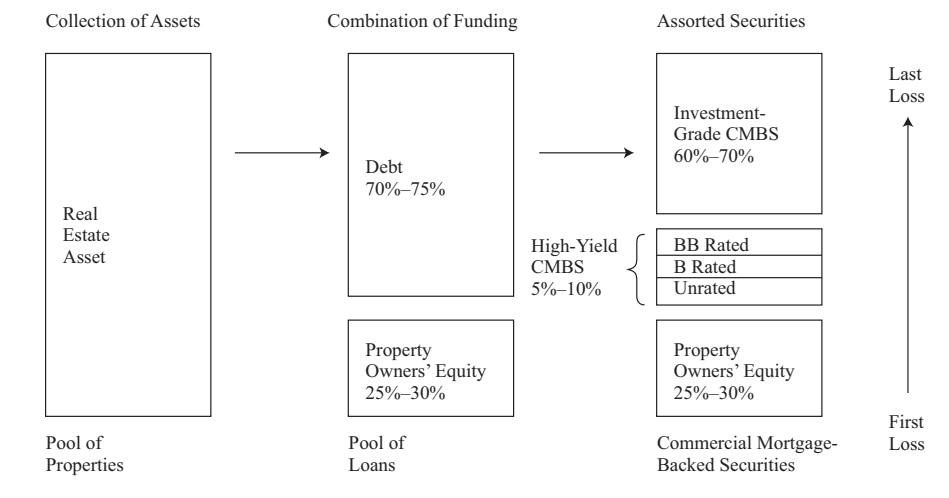
Gross income from rents represents a relatively predictable income stream and, after servicing the debt, is a source of return to equity REITs. Although the regulations with respect to REITs vary among countries, in general, equity REITs have an obligation to distribute the majority of their income to shareholders to retain their regulatory tax-advantaged status. Often, at least 90% of revenue (including rent and realized capital gains), net of expenses, must be distributed in the form of dividends.

The business strategy for equity REITs is simple: Maximize property occupancy rates and rents in order to maximize income and dividends. Equity REITs, like other public companies, must report earnings per share based on net income as defined by generally accepted accounting principles (GAAP).

5.2.4 Mortgage-Backed Securities

The MBS structure is based on the securitization model of buying a pool of assets and assigning the income and principal returns into individual security tranches, as illustrated in Exhibit 12 for commercial mortgage-backed securities (CMBS). On the right-hand side of the exhibit, the ranking of losses indicates the priority of claims against the real estate property. MBS may be issued privately or publicly. These securities are often included in broad fixed-income indexes and in indexes that are used to indicate the performance of real estate investments.

Exhibit 12 CMBS Security Structure



5.2.5 Timberland and Farmland

Timberland offers an income stream based on the sale of trees, wood, and other timber products and has been not highly correlated with other asset classes. Timberland can be thought of as both a factory and a warehouse. Timber (trees) can be grown and

³⁰ National Association of Real Estate Investment Trusts, July 2016.

easily stored by simply not harvesting. This feature offers the flexibility of harvesting more trees when timber prices are up and delaying harvests when prices are down. Timberland has three primary return drivers: biological growth, commodity price change of lumber (cut wood), and underlying land price change.

Farmland is often perceived to provide a hedge against inflation. Like timberland, the returns include an income component related to harvest quantities and agricultural commodity prices. Farmland consists of two main property types: row crops that are planted and harvested (i.e., more than one planting and harvesting can occur in a year depending on the crop and the climate) and permanent crops that grow on trees or vines. Unlike with timberland, farm products must be harvested when ripe, so there is little flexibility in production. Farmland may also be used as pastureland for livestock. Similar to timberland, farmland has three primary return drivers: harvest quantities, commodity prices (e.g., the price of corn), and land price change.

5.3 Real Estate Performance and Diversification Benefits

A variety of indexes globally are intended to measure returns to real estate. These indexes vary in the selection and valuation of components and longevity. A real estate index can generally be categorized as an appraisal index, a repeat sales (transaction-based) index, or a REIT index. Appraisal indexes use estimates of value (appraisals) as inputs. These evaluations, conducted by experts, often rely on comparable sales and cash flow analysis techniques and can be quite subjective, especially when there are few comparable properties. The appraisals should be done periodically, often annually, but some appraised values included in an index may be from more than one year earlier. This stale pricing factor—especially since appraisals are strongly influenced by their comparables—may result in indexes that understate volatility.

Repeat sales indexes are constructed using repeat sales of properties. The changes in property prices with repeat sales are measured and used to construct the index. These indexes suffer from a sample selection bias because the properties that sell in each period vary and may not be representative of the larger market. Also, the properties that transact do not represent a random sample and may be biased toward those that have increased or decreased in value, depending on current economic conditions. The higher the number of sales, the more reliable and relevant the index.

REIT indexes are constructed using the prices of publicly traded shares of REITs. The more frequently the shares trade, the more reliable the index. These indexes are not necessarily representative of the properties of interest to the investor because of different geographies, property types (residential, commercial, etc.), and property quality.

Investors will find a variety of indexes to choose from and may find one that is relevant to them. Investors should be aware, however, of how the index is constructed and the inherent limitations resulting from the construction method. Investors should also be aware that the apparent low volatility and low correlation of real estate with other asset classes may result from these limitations.

Exhibit 13 provides a comparison of returns on US real estate based on different indexes. The National Council of Real Estate Investment Fiduciaries (NCREIF) constructs a variety of appraisal-based indexes. The National Association of Real Estate Investment Trusts (NAREIT), together with the FTSE Group and the European Public Real Estate Association, constructs a variety of indexes based on the prices of shares of REITs and listed real estate companies. The NAREIT returns based on publicly traded US REIT share prices are clearly more volatile—displaying a higher standard deviation and a lower worst-calendar-year return—than the NCREIF returns based on appraisals. The NCREIF Farmland index shows the least reported volatility. The lowest annualized return shown is that of commercial property based on appraisals (NCREIF Property index).

Exhibit 13 Historical Returns of US Real Estate Indexes, 1991–2014

	NCREIF Data			NAREIT
	Property*	Timber	Farmland	All REITs
Annualized return	7.8%	10.5%	11.9%	11.9%
Annualized standard deviation	8.6%	9.2%	6.9%	18.9%
Worst calendar year	–16.9%	–5.2%	2.0%	–37.3%

* Commercial real estate property

Exhibit 14 displays global and regional REIT returns. The table shows some disparity among regional returns and supports the importance of knowledge of country, local, and regional markets. A cursory examination, however, indicates a significant degree of correlation among the regional returns. In fact, the correlations between the regional and global returns all exceed 0.9.

Exhibit 14 Historical Returns of Global REITs

	Global	Americas	Asia-Pacific	Europe	Middle East/Africa
3 Years	15.1%	13.8%	15.3%	18.2%	19.1%
5 Years	11.5%	15.5%	7.6%	9.6%	
10 Years	6.7%	7.8%	6.6%	4.1%	
15 Years	9.9%	12.4%	7.4%	9.8%	
Standard deviation (15 years)	23.4%	21.6%	28.1%	30.0%	

Note: Data are as of 31 December 2014.

Source: Based on data from FTSE NAREIT.

From 1990 through 2014, the monthly return correlations of global REITs (S&P Global REIT Index) with global stocks (MSCI ACWI) and global REITs with global bonds (Bloomberg Barclays Global Aggregate Index) were 0.62 and 0.35, respectively. Correlations of global real estate and equity returns are relatively high, and correlations of global real estate and bond returns are lower. The returns from investing in REITs and investing in equities are more highly correlated with each other than with bonds because they are affected similarly by the business cycle (i.e., economic expansion tends to support both equity and property prices).

5.4 Real Estate Valuation

Until a property is actually sold, real estate values can only be estimated. This estimation process is often referred to as appraising the property. A variety of approaches are used to value real estate property. Common techniques for appraising real estate property include comparable sales, income, and cost approaches.

- **Comparable sales approach.** This approach involves determining an approximate value based on recent sales of similar properties. Adjustments are made for differences in key characteristics of the property being appraised and the sold properties identified as similar. Key characteristics include condition, age, location, and size. Adjustments are also made for price changes in the relevant real estate market between dates of sales.

- **Income approach.** Direct capitalization and discounted cash flow approaches are income-based approaches to appraising an income-producing property.
 - The direct capitalization approach estimates the value of an income-producing property based on the level and quality of its net operating income (NOI). Similar to EBITDA, NOI represents the income to the property after deducting operating expenses, including property taxes, insurance, maintenance, utilities, and repairs but before depreciation, financing costs, and income taxes. NOI is a proxy for property-level operating cash flow. The expected annual NOI is divided by a capitalization rate (cap rate) to estimate the property's value. A cap rate is a discount rate less a growth rate. The reciprocal of the cap rate is a multiple that can be applied to NOI. The cap rate is estimated for a given property based on relevant information, including cap rates on sales of comparable properties, general business conditions, property quality, and assessment of management. The analysis might include assessing the strength of tenants, the level of landlord involvement, the extent and adequacy of repairs and improvements, the vacancy rate, management and operating costs, and expected inflation of costs and rent.
 - The discounted cash flow approach discounts future projected cash flows to arrive at a present value for the property. Typically, the analysis involves projections of annual operating cash flows for a finite number of periods and a resale or reversion value at the end of that total period. The projected resale value is often estimated using a direct capitalization approach.
- **Cost approach.** This approach evaluates the property's replacement cost by estimating the market value of the land and the costs of rebuilding using current construction costs and standards. Costs include building materials, labor to build, tenant improvements, and various "soft" costs, including architectural, engineering, and construction supervision costs; legal, insurance, and brokerage fees; and environmental assessment costs. The cost of rebuilding is the replacement cost of the building(s) in new condition and is adjusted to take into account the location and condition of the existing building(s).

A combination and reconciliation of the values from the different approaches is typically performed to increase confidence in the appraisal.

5.4.1 REIT Valuations

REITs are composed of a portfolio of real estate properties and/or mortgages, and as a result, a REIT security's valuation depends on the entire pool's characteristics. There are two basic approaches to estimating a REIT's intrinsic value: income based and asset based. The value estimates can be compared with the REIT's observed market price.

Income-based approaches for REITs are typically similar to the direct capitalization approach. A measure of income, which is a cash flow proxy, is capitalized into a value indication by using a cap rate (an alternative calculation could multiply the income measure by the reciprocal of the cap rate). Two common measures used are funds from operations (FFO) and adjusted funds from operations (AFFO). FFO, in its most basic form, equals net income plus depreciation charges on real estate property less gains from sales of real estate property plus losses on sales of real estate property. These adjustments to net income effectively exclude depreciation and the gains and losses from sales of real estate property from FFO. Depreciation is excluded because it represents a non-cash charge and is often unrelated to changes in the value of the property. Gains and losses from sales are excluded because they are assumed to be non-recurring. AFFO adjusts FFO for recurring capital expenditures. It is similar to a free cash flow measure.

The cap rate and its reciprocal multiple are estimated on the basis of a variety of factors, including market cap rates and current market and economic conditions, expectations for growth in the relevant measure, risks associated with the REIT's underlying properties, the financial leverage of the REIT, and multiples of recent transactions.

Asset-based approaches calculate a REIT's net asset value. Generally, a REIT's NAV is calculated as the estimated market value, based on appraisals, of a REIT's total assets minus the value of its total liabilities. REIT shares frequently trade at prices that differ from NAV per share. Both premiums and discounts to the NAV are observed in the day-to-day fluctuations of the REIT's share price.

5.5 Real Estate Investment Risks

Real estate investments, like any investment, may fail to perform in accordance with expectations. Property values are subject to variability based on national and global economic conditions, local real estate conditions, and interest rate levels. Other risks inherent to real estate investment include the ability of fund management to select, finance, and manage real properties, as well as changes in government regulations. Management of the underlying properties includes handling rentals or leasing of the property, controlling expenses, directing maintenance and improvements, and ultimately disposing of the property. Expenses may increase because of circumstances beyond management's control or be covered by insurance. Returns to both debt and equity investors in real estate depend to a large extent on the ability of the owners or their agents to successfully operate the underlying properties.

Investments in distressed properties and property development are subject to greater risks than investments in properties with stable operations and/or in sound financial condition. Property development is subject to special risks, including regulatory issues, construction delays, and cost overruns. Regulatory issues include the failure to receive zoning, occupancy, and other approvals and permits, as well as the effect of environmental regulation. Economic conditions can also change during the development and disposition period, which can be very lengthy. Adverse effects of regulatory issues and changes in economic conditions include increasing construction time or the time until a property is fully leased out, increasing construction costs, and decreasing the level of rents relative to initial expectations. Acquisitions and developments may be financed with lines of credit or other forms of temporary financing rather than long-term debt financing. There is a risk that long-term financing with acceptable terms might not be available when desired. Financing problems with one property may delay or limit further development by the same owner.

It is important to recognize that the vast majority of equity investment real estate funds pursue leverage to potentially increase returns to their investors. Leverage magnifies the effects of both gains and losses, because of operations and changes in property value, on the equity investors. Leverage increases the risk to debt investors as well as to equity investors. Leverage increases the risks that the real estate fund will have insufficient funds to make expected interest payments and that the debt investor will receive less than the entire principal upon repayment. As the loan-to-value ratio increases, the latter risk increases.

6

COMMODITIES

Commodities are physical products that can be standardized on quality, location, and delivery for the purpose of investing. Returns on commodity investments are primarily based on changes in price rather than on income from interest, dividends, or rent. In

fact, holding commodities (i.e., the physical products) incurs costs for transportation and storage. Thus, most commodity investors do not trade actual physical commodities but, rather, trade commodity derivatives. The underlying object for the commodity derivative may be a single commodity or an index of commodities.

Trading in physical commodities is primarily limited to a smaller group of entities that are part of the physical supply chain. Some investors that are not part of the supply chain may invest in physical commodities, but the commodities are typically those that are non-perishable, of high value relative to weight and volume, and easily stored at relatively low cost. Because of these logistical issues, most investors invest in commodities using commodity derivatives. Because the prices of commodity derivatives are, to a significant extent, a function of the underlying commodity prices, however, it is important to understand the physical supply chain and general supply–demand dynamics for a commodity. The supply chain consists of entities that actually produce the commodities, users of the commodities, and participants in between. These entities may trade commodity derivatives for hedging purposes. Other investors, sometimes referred to as speculators, trade commodity derivatives in search of profit based largely on changes or expected changes in the price of the underlying commodities. Non-hedging investors include retail and institutional investors, hedge funds, proprietary desks within financial institutions, and trading desks operating within the physical supply chain.

Commodity sectors include precious and base (i.e., industrial) metals, energy products, and agricultural products. Exhibit 15 shows some examples of each type. The relative importance, amount, and price of individual commodities evolve with society’s preferences and needs. For example, the increasing industrialization of China, India, and other emerging markets has driven strong global demand for commodities. Developing markets need increasing amounts of oil, steel, and other materials to support the manufacturing, infrastructure development, and consumption demands of their populations. Emerging technologies, such as advanced cellphones and electric vehicles, may create demand for new materials or destroy demand for old resources. Thus, commodities of interest evolve over time.

Exhibit 15 Examples of Commodities

Sector	Sample Commodities
Energy	Oil, natural gas, electricity, coal
Base metals	Copper, aluminum, zinc, lead, tin, nickel
Precious metals	Gold, silver, platinum
Agriculture	Grains, livestock, coffee
Other	Carbon credits, freight, forest products

Commodities may be further classified on the basis of a variety of factors, including physical location and grade or quality. For example, there are many grades and locations of oil. Similarly, there are many grades and locations of wheat. Commodity derivative contracts specify such terms as quantity, quality, maturity date, and delivery location.

Commodity derivatives may be attractive to investors not only for the potential profits but also because of the perceptions that commodities are effective hedges against inflation (i.e., commodity prices historically have been positively correlated with inflation) and that commodities are effective for portfolio diversification (i.e., commodity returns have historically low correlations with returns of other investments). Institutional investors—particularly endowments, foundations, and, increasingly, corporate and public pension funds, as well as sovereign wealth funds—are

allocating more of their portfolios to investments in commodities and commodity derivatives. There were \$326 billion in commodity investments under management in 2015, compared with less than \$20 billion in 2001.³¹

6.1 Commodity Derivatives and Indexes

The majority of commodity investing is implemented through derivatives, and commodity futures are a popular type of derivative.³² Commodity derivatives include futures, forwards, options, and swaps. These contracts may trade on exchanges or over the counter (OTC). They are described as follows:

- Futures and forward contracts are obligations to buy or sell a specific amount of a given commodity at a fixed price, location, and date in the future. Futures contracts are exchange traded, are marked to market daily, and may or may not be settled with the delivery or receipt of the physical commodity at the end of the contract. Forward contracts trade OTC, and the expectation is that delivery and receipt of the physical commodity will occur. Counterparty risk is held at the exchange and clearing broker levels for futures contracts and between the two counterparties for forward contracts.
- Option contracts for commodities give their holders the right, but not the obligation, to buy or sell a specific amount of a given commodity at a specified price and delivery location on or before a specified date in the future. Options are generally on futures contracts and can be either exchange or OTC traded.
- Swap contracts are agreements to exchange streams of cash flows between two parties based on future commodity or commodity index prices. One party typically makes fixed payments in exchange for payments that depend on changes in a specified commodity or commodity index price.

Commodity indexes typically use the price of futures contracts on the commodities included in them rather than the prices of the commodities themselves in order to make themselves investable and replicable. As a result, the performance of a commodity index can differ from the performance of the underlying commodities. Commodity indexes also vary in the commodities included in them and the weighting methods used. Thus, they vary in their exposures to specific commodities or commodity sectors.

6.2 Other Commodity Investment Vehicles

Commodity exposure can be achieved through means other than direct investment in commodities or commodity derivatives. Alternative means of achieving commodity exposure include the following:

- Exchange-traded products (either funds or notes) may be suitable for investors who can buy only equity shares or who seek the simplicity of trading them through a standard brokerage account. Exchange-traded products (ETPs) may invest in commodities or futures of commodities. For example, the SPDR Gold Shares attempts to track the price of physical gold by holding bullion in vaults in accordance to its NAV. It owned more than \$38 billion in gold bullion as of October 2016. ETPs may use leverage and may be long or short (also known as

³¹ Managed futures strategies; source: BarclayHedge (www.barclyhedge.com/research/indices/cta/Money_Under_Management.html).

³² Stoll and Whaley (2009) reported commodities indexing totaling \$174 billion as of July 2009.

“inverse”). Similar to mutual funds and unit trusts, ETPs charge fees that are included in their expense ratios, although the ETP expense ratios are generally lower than those of most mutual funds.

- Common stock of companies exposed to a particular commodity—such as Royal Dutch Shell, which is exposed to oil—may be purchased. Investors may consider owning shares in a few commodity-exposed companies in order to have a small exposure to commodities. Due to company hedging policies and other idiosyncratic factors (e.g., interest rates, taxes, geographic exposure), the performance of the stocks may or may not track the performance of the underlying commodities.
- Managed futures funds are actively managed investment funds. Professional money managers invest in the futures market (and sometimes the forward market) on behalf of the funds. These funds historically focused on commodity futures, but today they primarily invest in other futures contracts, such as those based on equities, fixed income, or foreign exchange. Managed futures funds may concentrate on specific commodity sectors or may be broadly diversified. They are similar to hedge funds in that each fund has a GP and fees typically follow a “2 and 20” structure. Some funds operate similarly to mutual funds, with shares that are available to the general public, whereas others operate like hedge funds and restrict sales to high-net-worth and institutional investors. The former may appeal to retail investors because of the professional management, low minimum investment, and relatively high liquidity. Given their broad exposures to non-commodity asset classes, these funds are often more akin to global macro in style.
- Individual managed accounts are similar to managed futures funds but are managed for a single client (e.g., an individual or institution), rather than a fund.
- Funds that specialize in specific commodity sectors exist. For example, private energy partnerships, similar to private equity funds, are a popular way for institutions to gain exposure to the energy sector. Management fees can range from 1% to 3% of committed capital, with a lockup period of 10 years and extensions of 1- and 2-year periods. Publicly available energy mutual funds and unit trusts typically focus on the oil and gas sector and often act as fixed-income investments, paying out dividends from rents or capital gains. They may focus on upstream (drilling), midstream (refineries), or downstream (chemicals). Management fees for these funds are in line with those of other public equity managers and range from 0.4% to 1%.

6.3 Commodity Performance and Diversification Benefits

The arguments for investing in commodities include the potential for returns, portfolio diversification, and inflation protection. Investors may invest in commodities if they believe prices will increase in the short or intermediate terms. If commodity prices determine inflation index levels, then over time, on average, commodities should yield a zero real return but serve as a real hedge against inflation risk. Commodity futures contracts may offer liquidity or other premiums, creating the opportunity for a real return different from zero.

The portfolio diversification argument is based on the observation that commodities historically have behaved differently from stocks and bonds during the business cycle. Exhibit 16 shows the correlation between selected commodity, global equity, and global bond indexes. In the 25-year period from 1990 through 2014, commodities exhibited a low correlation with traditional assets; the correlations of commodities with global stocks and global bonds were 0.247 and 0.183, respectively. The correlations of

stocks, bonds, and commodities are expected to be positive because each of the assets has some exposure to the global business cycle. Note that the selected commodity index—the S&P GSCI (Goldman Sachs Commodity Index)—is heavily weighted toward the energy sector and that each commodity may exhibit unique behavior.

Exhibit 16 Monthly Commodity Return Correlations, 1990–2014

	Global Stocks	Global Bonds	Commodities	One-Month Libor	US CPI
Global stocks	1.000	0.307	0.247	−0.054	−0.029
Global bonds		1.000	0.183	0.049	−0.038
Commodities			1.000	0.060	0.315
One-month Libor				1.000	0.166

Sources: Global stocks = MSCI ACWI; global bonds = Bloomberg Barclays Global Aggregate Index; commodities = S&P GSCI.

The argument for commodities as a hedge against inflation is related to the fact that some commodity prices affect inflation calculations. Commodities, especially energy and food, affect consumers' cost of living. The positive correlation of 0.315 between monthly commodity price changes and monthly changes in the US CPI supports this assertion. The monthly return correlations between the US CPI and global stocks and global bonds are close to zero. The volatility of commodity prices, especially energy and food, is much higher than that of reported consumer inflation. Consumer inflation is computed from many products used by consumers, including housing, that change more slowly than commodity prices. Commodity investments, especially when combined with leverage, exhibit high volatility and have led to many well-publicized losses among commodity players. Exhibit 17 provides a sample of these losses.

Exhibit 17 Large Commodity Investor Losses

Affected Company	Loss
Bank of Montreal (2007)	Wrong-way bets on natural gas led to a pre-tax loss of US\$663 million.
Amaranth Advisors LLC (2006)	Bad bets on natural gas triggered US\$6.6 billion of losses and closure of the US\$12 billion hedge fund.
China Aviation Oil (Singapore) Corp. (2004)	Loss of US\$550 million on speculative oil futures trades, forcing debt restructuring

Source: "The 20 Biggest Trading Disasters," *Telegraph* (January 2008).

6.4 Commodity Prices and Investments

Commodity spot prices are a function of supply and demand, costs of production and storage, value to users, and global economic conditions. Non-hedging investors with positions in physical commodities may be accumulating or divesting a particular commodity. Supplies of commodities are determined by production and inventory levels as well as the actions of non-hedging investors. Demand for commodities is determined by the needs of end users and the actions of non-hedging investors.

Commodity supplies cannot be altered quickly by producers because extended lead times often exist and affect production levels. For example, agricultural output may be altered by planting more crops and changing farming techniques, but at least

one growing cycle is required before the actual output occurs. And for agricultural products, at least one factor that is outside of the producer's control—the weather—will significantly affect output. Increased oil and mining production may require a number of years to build the necessary infrastructure. Weather can also have a significant effect on oil production in parts of the world. For commodities, suppliers' inability to quickly respond to changes in demand levels may result in supply levels that are too low in times of economic growth and too high in times of economic slowing. In addition, despite advancing technology, the cost of new supply may grow over time. For example, the cost of new energy and mineral exploration tends to exceed that of past finds because the easy discoveries tend to be exploited first. If production costs are high, producers are unlikely to produce more than what is needed to meet anticipated demand and are unlikely to maintain more than modest levels of inventory, leading to the risk of shortages and price spikes.

Overall demand levels are influenced by global manufacturing dynamics and economic growth. Manufacturing needs can change in a period of months as orders and inventories vary. Investors seek to anticipate these changes by monitoring economic events, including government policy, inventory levels, and growth forecasts. When demand levels and investors' orders to buy and sell during a given period change quickly, the resulting mismatch of supply and demand may lead to price volatility.

6.4.1 Pricing of Commodity Futures Contracts

It is important to understand futures contracts and the sources of return for each commodity futures contract because commodity investments often involve the use of futures contracts. These contracts trade on exchanges. The buyer (i.e., the long side) of a futures contract is obligated to take delivery of the commodity or its cash equivalent based on the spot price at expiration and will pay a settlement price. The settlement price is calculated as specified in the contract based on its standard quantity (e.g., 1,000 barrels for Brent Crude Oil). In other words, the long side is obligated to buy the commodity at the final settlement price and take delivery at one of the locations specified in the contract. The long side of a futures contract increases in value when the underlying commodity increases in value. The seller of a futures contract (i.e., the short side) is obligated to deliver the commodity at the location specified in the contract or its cash equivalent based on the settlement price at expiration.

Parties to a futures contract are required to make an initial margin contribution on the contract (i.e., provide collateral) on their own margin account. Futures contracts and margin accounts are marked to market daily, which means that on a daily basis, the futures exchange calculates price changes in the contract and the values of the margin accounts increase or decrease depending on the price direction and positions. If the value in a margin account declines sufficiently, the investor will receive a margin call and will be required to make an additional payment into the margin account. If the investor is unable or unwilling to do so, her position will be closed by her clearing broker.

Given the characteristics of a commodity, the price of a futures contract (futures price) may be approximated by the following formula:³³

$$\text{Futures price} \approx \text{Spot price} (1 + r) + \text{Storage costs} - \text{Convenience yield}$$

where r is the period's short-term risk-free interest rate. Arbitrage opportunities exist if the futures price differs from the spot price compounded at the risk-free rate. For example, if a commodity's spot price (current price available for immediate physical delivery) is 100, the risk-free rate is 5%, and the one-year futures price is 107 as opposed to 105, an arbitrageur can buy the commodity for 100 and sell a futures

³³ Futures pricing is discussed in greater detail in Level II of the CFA Program curriculum.

contract for 107. Assuming no storage costs, when the commodity is delivered for 107, the arbitrageur earns 2 points in excess of that earned investing in the risk-free asset. However, commodities typically incur a storage cost. The buyer of a futures contract, in effect, gains access to the commodity in the future without buying it now and incurring storage costs. The futures price includes an amount for storage costs of the underlying commodity during the life of the contract. The storage and interest costs together are sometimes referred to as the “cost of carry” or the “carry.” Finally, the buyer of the futures contract has no immediate access to the commodity but will receive it in the future. The buyer has given up the convenience of having physical possession of the commodity and having it immediately available for use. The futures price is adjusted for the loss of convenience; the convenience yield is subtracted to arrive at the futures price. The value of convenience may vary over time and across users. For example, the convenience yield to having heating oil in January in Canada is higher than the convenience yield to having heating oil in Canada in July or to having heating oil in Australia in January.

Futures prices may be higher or lower than spot prices depending on the convenience yield. When futures prices are higher than the spot price, the commodity forward curve is upward sloping and the prices are referred to as being in contango. *Contango* occurs when there is little or no convenience yield. When futures prices are lower than the spot price, the commodity forward curve is downward sloping and the prices are referred to as being in backwardation. *Backwardation* occurs when the convenience yield is high.

There are three sources of return for each commodity futures contract: the roll yield, the collateral yield, and the change in spot prices for the underlying commodity.

6.4.1.1 Roll Yield The term “roll yield” refers to the difference between a commodity’s spot price and the price specified by its futures contract (or the difference between two futures contracts with different expiration dates). The formula shows that with a convenience yield high enough to position the futures price below the spot price, the price of the futures contract generally rolls up to the spot price as the expiry date of the futures contract approaches. This price convergence earns the bearer of the futures contract a positive roll yield. This explanation is called the *theory of storage*. An alternative theory, called the *hedging pressure hypothesis*, suggests the difference between the spot and futures prices is determined by user preferences between producers and consumers and risk premiums.

6.4.1.2 Collateral Yield The collateral yield component of commodity index returns is the interest earned on the collateral posted as a good-faith deposit for the futures contracts (plus invested cash up to the value of the underlying asset). In measuring this return component, index managers typically assume that futures contracts are fully collateralized and that the collateral is invested in risk-free assets. Thus, the returns on a passive investment in commodity futures are expected to equal the return on the collateral plus a risk premium (i.e., the hedging pressure hypothesis) or the convenience yield net of storage costs (i.e., the theory of storage).

6.4.1.3 Change in Spot Prices The primary determinant of spot (or current) prices is the relationship between current supply and demand, as discussed earlier.

INFRASTRUCTURE

7

The assets underlying infrastructure investments are real, capital intensive, and long-lived. These assets are intended for public use and provide essential services. An example is an airport. Most infrastructure assets are financed, owned, and operated by governments, but increasingly, infrastructure assets are being financed privately. The use of public–private partnerships (PPPs) is increasing with local, regional, or national governments partnering with investors. By the end of 2014, infrastructure funds had invested more than \$200 billion in infrastructure projects, up from \$6 billion in 2004.³⁴

The intent of infrastructure investor(s) may be to lease the assets back to the government, to sell newly constructed assets to the government, or to hold and operate the assets. From an investment perspective, if the assets are being held and operated, the relatively inelastic demand for the assets and services is advantageous; regulation and the high costs of the assets create high barriers to entry, which give the provider of the services a strong competitive position. Maintenance and operating costs should also be considered.

Investors expect these assets to generate stable cash flows, which adjust for economic growth and inflation. Investors may also expect capital appreciation depending on the type of investment.

Investing in infrastructure may enable investors to add an income stream, to further diversify their portfolio by adding an asset class with a low correlation with other investments, and to gain some protection against inflation. Infrastructure investments, which are in long-lived assets, may also better match the longer-term liability structure of some investors, such as pension funds and life insurance companies. Allocations to infrastructure investments have increased not only because of renewed interest by investors (demand side) but also because of an increase in investment opportunities provided by governments due to their desire to expand the financing of infrastructure assets and to privatize the provision of services.

7.1 Categories of Infrastructure Investments

Infrastructure investments are frequently categorized on the basis of underlying assets. The broadest categorization is into economic and social infrastructure assets. Economic infrastructure assets are necessary to support economic activity, and they include such assets as transportation and utility assets. Transportation assets include such assets as roads, bridges, tunnels, airports, ports, and railway lines. Utility assets include assets to transmit, store, and distribute gas, water, and electricity; generate power; treat waste; and broadcast and transmit information. The latter assets may be categorized separately as communication assets. Social infrastructure assets are directed toward human activities and include such assets as educational, health care, and correctional facilities.

Infrastructure investments may also be categorized by the underlying asset's stage of development. Investing in existing infrastructure assets may be referred to as “brownfield investment.” The assets may be currently owned by a government that wants to privatize the asset, to lease out the asset, or to sell and lease back the asset. Typically, some financial and operating history is available on the asset. Investing in infrastructure assets that are to be constructed may be referred to as “greenfield investment.” The intent may be to hold and operate the assets or to lease or sell the assets to the government after construction.

³⁴ Preqin Performance Analyst, 2015.

Infrastructure investments may also be categorized by the geographical location of the underlying assets. Infrastructure investments are available globally. Risks and expected returns may differ on the basis of the underlying asset's category, stage of development, and geographical location. The form of investment also affects risks and expected returns.

7.2 Forms of Infrastructure Investments

Infrastructure investments, similar to real estate investments, may take a variety of forms. The investment form potentially affects the investment's liquidity as well as the cash flows and income streams to the investor. An investor may invest directly in the underlying assets, but most investors invest indirectly. Investing directly in infrastructure provides control over the asset and the opportunity to capture the asset's full value. However, it entails a large investment, resulting in concentration and liquidity risks, and the assets must be managed and operated. Indirect investment vehicles include investment in an infrastructure fund (similar in structure to private equity funds) and infrastructure ETFs, as well as in shares of companies. Investors concerned about liquidity and diversification may choose to invest through publicly traded infrastructure securities and/or master limited partnerships.

Publicly traded infrastructure securities provide the benefit of not only liquidity but also reasonable fees, transparent governance, market prices, and the ability to diversify across underlying assets. Investors should be aware, however, that publicly traded infrastructure securities represent a small segment of the infrastructure investment universe and tend to be clustered in categories of assets. Master limited partnerships (MLPs) trade on exchanges and are pass-through entities similar to REITs. As with REITs, regulations may vary across countries, and income is passed through to the investors for taxation. MLPs generally distribute most free cash flow to their investors. Typically, the GP manages the partnership, receives a fee, and holds a small partnership interest, with LPs owning the remaining majority partnership interest.

7.3 Risk and Return Overview

The lowest-risk infrastructure investments have more-stable cash flows and higher dividend payout ratios but also typically have fewer growth opportunities and lower expected returns compared with higher-risk infrastructure investments. For example, an investment in an MLP with a brownfield investment in an asset that is being leased back to a government, such as a school, or in an asset with a history of steady cash flows, such as certain toll roads, represents a low-risk infrastructure investment. An investment in a fund that is building a new power plant without operating history (a greenfield investment) is riskier.

Risks include revenues being different from expectations, leverage creating financing risk, operational risk, and construction risk. An inherent risk for many infrastructure investments is regulatory risk. Because essential services are often being provided, governments typically regulate many aspects of infrastructure investments, including the sale of the underlying assets; operations of the assets, including service quality; and prices/profit margins. Global infrastructure investing introduces additional risks, such as currency, political, and profit repatriation risks.

Prequin maintains a return series of private funds investing in infrastructure deals. Standard & Poor's, FTSE, and other firms publish indexes of publicly traded infrastructure companies.

OTHER ALTERNATIVE INVESTMENTS

8

Numerous other investments do not fit within the definition of traditional investments (i.e., long-only investments in stocks, bonds, and cash) and may be considered alternative investments. Many of these other investments are categorized as collectibles.

Collectibles are tangible assets such as antiques and fine art, fine wine, rare stamps and coins, jewelry and watches, and sports memorabilia. Collectibles do not provide current income, but they can potentially provide long-term capital appreciation, diversify a portfolio, and be a source of enjoyment while held. There is no guarantee, however, that an investor will realize any of these benefits. Collectibles can fluctuate dramatically in value and be highly illiquid, with potential difficulty in realizing gains. Transactions can occur in a number of ways and settings, including through professional auctioneers; in local flea markets, online auctions, garage sales, and antique stores; or directly with personal collectors. Investors must have a degree of expertise; otherwise, one may be vulnerable to fads, fakes, and fraud. Also, some collectibles must be stored in appropriate conditions to preserve their quality and avoid declines in value because of the asset's deterioration. Wine should be cellared, art should be kept in a humidity- and temperature-controlled environment, and coins and stamps must be handled with care to preserve their value. Although some collectibles (e.g., some great wines; fine art; and rare stamps, coins, and trading cards) have experienced great appreciation, this result is by no means the norm.

The popularity of art as an investment has led to the creation of a number of art price indexes. For example, Artprice provides statistics, econometric data, and indexes to help measure returns on artworks. Another company that develops indexes, Art Market Research, does not restrict itself to art but has more than 500 indexes in three broad categories: Painting; Antiques, Collectibles, Etc.; and Other Markets. These indexes range from very broad (e.g., Painting [General] and Antiques [General]) to more specific (e.g., Chinese Ceramics [General] and Ancient Coins [General]) to very specific (e.g., Wrist-Watches Patek Philippe, Continental Flint-Lock Pistols 1700–1800, and in wine, Château Lafite 1961). Subscribers are even able to specify parameters and create their own indexes. Christie's first published an index of wine auction prices (listed by château) in 1972.

RISK MANAGEMENT OVERVIEW

9

Alternative investments pose unusual challenges for investors seeking to manage risk. They are often characterized by asymmetric risk and return profiles, limited portfolio transparency, and illiquidity. Investors in alternatives may be exposed to a variety of risks, including operational risk, financial risk, counterparty risk, and liquidity risk. The returns to some types of alternatives, such as private equity, may rely to a great extent on manager skill rather than on general asset class performance. For these reasons, traditional risk and return measures (such as mean return, standard deviation of returns, and beta) may not provide an adequate picture of alternative investments' characteristics. Moreover, these measures may be unreliable or not representative of specific investments.

9.1 Investment and Risk Management Process

Investment risk management is not solely the responsibility of either the investor or the manager of an investment portfolio. The investor, possibly in consultation with others, decides on an allocation to alternative investments. The investor then needs to

choose the vehicles and managers of the investments as well as the amounts that will be allocated to each alternative investment class and manager. Risk has to be taken into account and due diligence conducted in making these decisions. The investment portfolio manager has to make investment decisions consistent with the portfolio's established investment policies or amend those policies appropriately. Investor due diligence investigates more thoroughly how the portfolio manager effectively manages portfolio risk. Pension consultants, wealth managers, and individual investors all need to recognize that risk management processes can differ substantially between different alternative investment categories.

9.1.1 Risk Management Issues

Risks vary among alternative investments. The risks associated with investing in private markets (e.g., private equity funds and real estate ownership) differ from the risks associated with investing in public markets (e.g., commodity futures and REITs). Private equity and direct real estate ownership may involve selecting companies or properties, managing them, and then selling them years later. Private equity and direct real estate funds may have long lockup periods. As a result, investors' capital may be tied up for many years. Periodic valuations can be challenging because of sparse transactions. As a result, any malfeasance or mismanagement may go undetected for years, so investor due diligence and auditing is more critical in these circumstances. The illiquid nature of alternative investments also means that poor manager selection can create a lingering drag on the portfolio. Limited partnership vehicles may limit the visibility of underlying holdings and liquidity because the legal structure stands between investors and their assets.

Portfolios of publicly traded securities are more liquid and have prices that are more timely and observable than those of privately held assets. For investors who seek liquidity, such publicly traded securities as shares of REITs, ETFs, and publicly traded private equity firms may serve as the means for investing in alternatives. Finally, the manager's strategy may be available via a separate account, so holdings are more transparent and valuation issues are more easily settled.

9.1.2 Risk Issues for Implementation

For allocation purposes, the investor should recognize that historical returns and the standard deviation of those returns using indexes may not be representative of the returns and volatility of specific alternative investment funds. This often implies that those investments' reported correlations with other investments may vary from the index correlations. As is always the case, even if these are relevant and representative measures of historical performance, past performance is not necessarily representative of future performance. The performance of alternative investments can be highly correlated with the business cycle, especially for commodities and real estate investments, and may be susceptible to bubbles (i.e., much higher prices than are justified by fundamentals) owing to money flow and investor sentiment. Investors should consider market conditions and the manager's skill in those conditions before making allocation changes.

When selecting managers or funds, the investor should recognize that returns and risks may differ significantly among individual managers or funds and the overall investment class. Large institutional investors deal with this challenge by diversifying across managers or funds, but this approach may not be practical for smaller investors. As a result, these smaller investors may be forced to invest in publicly traded securities (e.g., ETFs) or with a limited number of large, diversified funds.

Alternative investment portfolio managers need to be mindful of several risks. In the case of illiquid investments, most notably in private equity or venture capital, there is a real possibility of 100% loss of equity on individual investments. Even liquid investments, such as managed futures, can experience high volatility. As a result,

portfolios should be diversified sufficiently to reduce the possibility of this outcome at the portfolio level. Investors commonly require managers to follow diversification concentration guidelines or look for managers that hedge more fully to limit these risks. At the same time, the manager should avoid diluting the opportunity for making substantial returns by arbitrarily identifying a target number of investments and, in the process, selecting inferior investments. Finally, investors and managers should describe in fund guidelines the management of the risk associated with the use of leverage.

Performance fee structures, although high, may encourage alignment of interests between investors and managers. Established portfolio managers, however, may seek to attract large amounts of capital and to profit from the management fees based on AUM or committed capital without seeking superior performance. Performance fees may also encourage hedge fund managers who experience a large loss to liquidate their funds instead of working them back to par. Investors, therefore, should note the impact of fund size and capacity as well as the manager commitment to the clients.

9.1.3 *Due Diligence Issues Regarding Risk*

Due diligence of alternative investment managers necessitates special procedures beyond the process required for a manager of a portfolio of publicly traded securities. Historical performance measures may be unreliable or not representative as a result of intermediate valuation estimates and narrow portfolio diversification. With the limited transparency and long horizons of many alternative investments, the honesty of the company's staff needs to be carefully reviewed.

Hedge funds will have trading desks much like long-only investment firms, but private equity and real estate companies usually make investment decisions via an investment committee of partners. The investment committee may or may not include external non-executive directors or subject matter experts. The committee votes on the rationale, analysis, and suitability of every investment and requires a majority in favor before investor funds are committed. This committee may also oversee and vote on investments' exit strategies, including timing and realization price.

Independent valuation of illiquid underlying assets (an audit) should be performed regularly. Often, this analysis is done in conjunction with a portfolio review explaining the performance of every transaction in detail, its status, and the future strategy for the portfolio. Limits on security type, leverage, sector, geography, and individual positions should be well defined in the offering memorandum, and the positions should be carefully monitored by the manager and regularly reported to clients.

Hedge fund risk is often monitored by a chief risk officer, who should be separated from the investment process. As part of the risk management process, a hedge fund needs to establish and maintain limits on leverage, sector, and individual positions. Investments in physical commodities may be subject to counterparty risks, and public security hedge funds (those in equity, fixed-income, and managed futures strategies) are particularly affected by leverage risks. The exposure to counterparty risk and leverage risk should be regularly monitored and reported. Policies limiting leverage, positions, and sectors as well as counterparty exposures may be adopted.

One issue for investors is that hedge funds and commodity funds might seek to keep their positions and strategies private to extend the life of their alpha process (i.e., their process for adding value through active investing) and preserve their relative expertise. This lack of transparency makes it difficult for the investor to effectively manage diversification across funds and to conduct adequate due diligence.

9.2 Risk–Return Measures

The Sharpe ratio is a risk–return measure frequently reported because of its ease of calculation and understandability. However, the Sharpe ratio is not the appropriate risk–return measure for some alternative investments because measures of return and

standard deviation may be irrelevant or unreliable given the assets' illiquid nature. The illiquid nature of these assets means that estimates, rather than observable transaction prices, may have been used for valuation purposes. As a result, returns may be smoothed and/or overstated and the volatility of returns understated. Also, the use of standard deviation to measure risk ignores the diversification effect for a broad portfolio of managers and alternative investments.

Many alternative investments do not exhibit close-to-normal distributions of returns, which is a crucial assumption for standard deviation's validity as a comprehensive risk measure. Alternative investment returns tend to be leptokurtic, or negatively skewed (in other words, they have fat tails characterized by positive average returns and long tails downside characterized by potential extreme losses). For this reason, a measure of downside risk, ideally non-normal, would be useful. Downside risk measures focus on the left side of the return distribution curve, where losses occur. For example, value at risk (VaR) is a measure of the minimum amount of loss expected for a given period at a given level of probability. In other words, this measure can answer such questions as, What is the minimum amount expected to be lost in a year with a 5% probability? This measure, however, if it is calculated using standard deviation, will underestimate the VaR for a negatively skewed distribution. Shortfall or safety-first risk measures the probability that the portfolio value will fall below some minimum acceptable level over a given period. In other words, this measure can answer such questions as, What is the probability of losing 20% of principal in any given year? Shortfall risk also uses standard deviation as the measure of risk. The Sortino ratio, another risk–return measure, uses downside deviation, rather than standard deviation, as a measure of risk. Assuming normal probability distributions when calculating these measures will lead to underestimating downside risk for a negatively skewed distribution.

Understanding and evaluating “tail events”—low-probability, severe instances of stress—is an important yet extraordinarily difficult aspect of the risk management process. Stress testing/scenario analysis is often used as a complement to VaR to develop a better understanding of a portfolio's potential loss under both normal and stressed market conditions. Stress testing involves estimating losses under extremely unfavorable conditions. Quantitative or systematic processes are likely easier to examine than more discretionary investment approaches.

9.3 Due Diligence Overview

Manager selection is a critical factor in portfolio performance. A manager should have a verifiable track record and display a high level of expertise and experience with the asset type. The asset management team should be assigned an appropriate workload and provided sufficient resources. Moreover, it should be rewarded with an effective compensation package to ensure alignment of interest, continuity, motivation, and thoughtful oversight of assets.

Fraud, although infrequent, is always a possibility. The investor should be skeptical of unusually good and overly consistent reported performance. Third-party custody of assets and independent verification of results can help reduce the chance of an investor being defrauded. Diversification among managers is also wise. Finally, separate accounts make theft more difficult because the investor retains custody of the assets and sometimes can select the prime broker or other service providers, binding them to the client's interest.

For an investor considering a new investment, a proper due diligence process should be carried out to ensure that the targeted investment is in compliance with its prospectus and that it will meet his investment strategy, risk and return objectives,

and restrictions. Existing investors should monitor results and fund holdings to determine whether a fund has performed in line with expectations and continues to comply with its prospectus.

Exhibit 18 lists key items that should be considered in a typical due diligence process.

Exhibit 18 A Typical Due Diligence Process

Organization	<ul style="list-style-type: none"> ■ Experience and quality of management team, compensation, and staffing ■ Analysis of prior and current funds ■ Track record/alignment of interests ■ Reputation and quality of third-party service providers (e.g., lawyers, auditors, prime brokers)
Portfolio management	<ul style="list-style-type: none"> ■ Investment process ■ Target markets/asset types/strategies ■ Sourcing of investments ■ Role of operating partners ■ Underwriting ■ Environmental and engineering review process ■ Integration of asset management/acquisitions/dispositions ■ Disposition process, including its initiation and execution
Operations and controls	<ul style="list-style-type: none"> ■ Reporting and accounting methodology ■ Audited financial statements and other internal controls ■ Valuations—frequency and approach(es) ■ Insurance and contingency plans
Risk management	<ul style="list-style-type: none"> ■ Fund policies and limits ■ Risk management policy ■ Portfolio risk and key risk factors ■ Leverage and currency—risks/constraints/hedging
Legal review	<ul style="list-style-type: none"> ■ Fund structure ■ Registrations ■ Existing/prior litigation
Fund terms	<ul style="list-style-type: none"> ■ Fees (management and performance) and expenses ■ Contractual terms ■ Investment period and fund term and extensions ■ Carried interest ■ Distributions ■ Conflicts ■ Limited partners' rights ■ "Key person" and/or other termination procedures

Alternative investing may add value to an investor's portfolio. To be effective, however, alternative investing requires thoughtful implementation, including consideration of the amount to allocate to alternative investments and of diversification among alternative investments. Valuation issues, manager selection, and risk management should also be considered.

SUMMARY

This reading has provided an overview of the characteristics, potential benefits, and risks of alternative investments. It also described features of some categories of alternative investments. Including alternative investments in an investor's portfolio may result in a higher Sharpe ratio for the overall portfolio because of diversification benefits. However, these benefits do not come without associated risks. It is important for investors to understand these risks before including alternative investments in their portfolios. Some key points of the reading are summarized as follows:

- Alternative investments are supplemental strategies to traditional long-only positions in stocks, bonds, and cash. Alternative investments include investments in long–short public market strategies and such less common assets as private equity, real estate, infrastructure, and commodities. Often these investments are made via limited partnerships and special purpose vehicles.
- Alternative investment strategies are typically active, return-seeking strategies that often have different risks from those in indexed public markets.
- Characteristics common to many alternative investments, when compared with traditional investments, include the following: lower liquidity, less regulation, lower transparency, higher fees, and limited and potentially problematic historical risk and return data.
- Alternative investments often have complex legal and tax considerations and may be highly leveraged.
- Alternative investments are attractive to investors because of the potential for portfolio diversification (reduced risk) and higher portfolio returns when added to a portfolio of traditional investments.
- The risks associated with alternative investments must be factored into the investment decision-making process.
- Many alternative investments are valued by using estimated values rather than actual market prices. These values are then reported to index providers for performance-reporting purposes. As a result, the volatility of returns and correlation of returns vis-à-vis traditional investments will tend to be underestimated. It is important to identify and understand how alternative investments are valued, particularly owing to illiquidity.
- Indexes for alternative investments may be subject to a variety of biases, including survivorship and backfill biases.
- Many alternative investments, such as hedge and private equity funds, use a partnership structure with a general partner that manages the business and limited partners (investors) who own fractional interests in the partnership.
- The general partner typically receives a management fee based on assets under management or committed capital (the former is common to hedge funds and the latter is common to private equity funds) and an incentive fee based on realized profits.
- Hurdle rates, high-water marks, lockup and notice periods, and clawback provisions are often specified in a partnership agreement.
- The fee structure affects the returns to investors (limited partners) in such alternative investments as hedge and private equity funds.
- Hedge funds are typically classified by strategy. One such classification includes four broad categories of strategies: event driven, relative value, macro, and equity hedge.

- Primary private equity fund strategies include leveraged buyouts, venture capital, development capital, and distressed investing. Leveraged buyouts and venture capital are the dominant strategies.
- Real estate investing includes direct and indirect ownership of real estate property and lending against real estate property.
- Real estate property has some unique features, including basic indivisibility, heterogeneity (no two properties are identical), and fixed location.
- The required amount to directly invest in real estate may be large in order to achieve adequate diversification, and the investment may be relatively illiquid. Various investment forms, such as REITs and mortgage securitizations, partially address these issues.
- Commodity investments may involve investing in actual physical commodities or in producers of commodities, but more typically, these investments are made using commodity derivatives (futures or swaps).
- Returns to commodity investing are based on changes in price and do not include an income stream, such as dividends, interest, or rent (apart from income earned on the collateral).
- Infrastructure assets are capital intensive, long-lived, real assets that are intended for public use and provide essential services. Investors expect these assets to generate stable cash flows, which typically are adjusted upward with economic growth and inflation, and they may also expect capital appreciation of the infrastructure assets.
- Category, stage of development, and geographic location of underlying assets and the form of infrastructure investment affect risks and expected returns of infrastructure investments.
- Managing risks associated with alternative investments can be challenging because these investments are often characterized by asymmetric risk/return profiles, limited portfolio transparency, and illiquidity.
- Traditional risk and return measures (such as mean return, standard deviation of returns, and beta) may provide an inadequate picture of alternative investments' risk and return characteristics. Moreover, these measures may be unreliable or not representative of specific investments.
- Operational, financial, counterparty, and liquidity risks may be key considerations for those investing in alternative investments.
- It is critical to perform due diligence to assess whether or not (a) the manager can effectively pursue the proposed investment strategy; (b) the appropriate organizational structure and policies for managing investments, operations, risk, and compliance are in place; and (c) the fund terms appear reasonable.
- The inclusion of alternative investments in a portfolio, including the amounts to allocate, should be considered in the context of an investor's risk–return objectives, constraints, and preferences.

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PRACTICE PROBLEMS

- 1 Which of the following is *least likely* to be considered an alternative investment?
 - A Real estate
 - B Commodities
 - C Long-only equity funds
- 2 Private equity funds are *most likely* to use:
 - A merger arbitrage strategies.
 - B leveraged buyouts.
 - C market-neutral strategies.
- 3 An investor is seeking an investment that can take long and short positions, may use multi-strategies, and historically exhibits low correlation with a traditional investment portfolio. The investor's goals will be *best* satisfied with an investment in:
 - A real estate.
 - B a hedge fund.
 - C a private equity fund.
- 4 Relative to traditional investments, alternative investments are *least likely* to be characterized by:
 - A high levels of transparency.
 - B limited historical return data.
 - C significant restrictions on redemptions.
- 5 Alternative investment funds are typically managed:
 - A actively.
 - B to generate positive beta return.
 - C assuming that markets are efficient.
- 6 Compared with traditional investments, alternative investments are *more likely* to have:
 - A greater use of leverage.
 - B long-only positions in liquid assets.
 - C more transparent and reliable risk and return data.
- 7 The potential benefits of allocating a portion of a portfolio to alternative investments include:
 - A ease of manager selection.
 - B improvement in the portfolio's risk–return relationship.
 - C accessible and reliable measures of risk and return.
- 8 An investor may prefer a single hedge fund to a fund of funds if he seeks:
 - A due diligence expertise.
 - B better redemption terms.
 - C a less complex fee structure.
- 9 Hedge funds are similar to private equity funds in that both:
 - A are typically structured as partnerships.

- B assess management fees based on assets under management.
 - C do not earn an incentive fee until the initial investment is repaid.
- 10 An investor seeks a current income stream as a component of total return, and desires an investment that historically has low correlation with other asset classes. The investment *most likely* to achieve the investor's goals is:
- A timberland.
 - B collectibles.
 - C commodities.
- 11 Both event-driven and macro hedge fund strategies use:
- A long–short positions.
 - B a top-down approach.
 - C long-term market cycles.
- 12 Hedge fund losses are *most likely* to be magnified by a:
- A margin call.
 - B lockup period.
 - C redemption notice period.
- 13 The first stage of financing at which a venture capital fund *most likely* invests is the:
- A seed stage.
 - B mezzanine stage.
 - C angel investing stage.
- 14 What is the most significant drawback of a repeat sales index to measure returns to real estate?
- A Sample selection bias
 - B Understatement of volatility
 - C Reliance on subjective appraisals
- 15 Compared with direct investment in infrastructure, publicly traded infrastructure securities are characterized by:
- A higher concentration risk.
 - B more-transparent governance.
 - C greater control over the infrastructure assets.
- 16 An equity hedge fund following a fundamental growth strategy uses fundamental analysis to identify companies that are *most likely* to:
- A be undervalued.
 - B be either undervalued or overvalued.
 - C experience high growth and capital appreciation.
- 17 Which of the following is most likely to be available when conducting hedge fund due diligence?
- A The benchmark used by the fund
 - B Information on systems risk management
 - C Details of investment strategies and processes
- 18 A private equity fund desiring to realize an immediate and complete cash exit from a portfolio company is *most likely* to pursue a(n):
- A IPO.
 - B trade sale.

- C recapitalization.
- 19 As the loan-to-value ratio increases for a real estate investment, risk *most likely* increases for:
- A debt investors only.
 - B equity investors only.
 - C both debt and equity investors.
- 20 Which of the following forms of infrastructure investments is the most liquid?
- A An unlisted infrastructure mutual fund
 - B A direct investment in a greenfield project
 - C An exchange-traded master limited partnership (MLP)
- 21 An investor chooses to invest in a brownfield rather than a greenfield infrastructure project. The investor is *most likely* motivated by:
- A growth opportunities.
 - B predictable cash flows.
 - C higher expected returns.
- 22 The privatization of an existing hospital is best described as:
- A a greenfield investment.
 - B a brownfield investment.
 - C an economic infrastructure investment.
- 23 A hedge fund invests primarily in distressed debt. Quoted market prices are available for the underlying holdings but they trade infrequently. Which of the following will the hedge fund *most likely* use in calculating net asset value for trading purposes?
- A Average quotes
 - B Average quotes adjusted for liquidity
 - C Bid prices for short positions and ask prices for long positions
- 24 Angel investing capital is typically provided in which stage of financing?
- A Later-stage.
 - B Formative-stage.
 - C Mezzanine-stage.
- 25 If a commodity's forward curve is in contango, the component of a commodities futures return *most likely* to reflect this is:
- A spot prices.
 - B the roll yield.
 - C the collateral yield.
- 26 United Capital is a hedge fund with \$250 million of initial capital. United charges a 2% management fee based on assets under management at year end, and a 20% incentive fee based on returns in excess of an 8% hurdle rate. In its first year, United appreciates 16%. Assume management fees are calculated using end-of-period valuation. The investor's net return assuming the performance fee is calculated net of the management fee is *closest* to:
- A 11.58%.
 - B 12.54%.
 - C 12.80%.

27 Capricorn Fund of Funds invests GBP 100 million in each of Alpha Hedge Fund and ABC Hedge Fund. Capricorn FOF has a “1 and 10” fee structure. Management fees and incentive fees are calculated independently at the end of each year. After one year, net of their respective management and incentive fees, the investment in Alpha is valued at GBP80 million and the investment in ABC is valued at GBP140 million. The annual return to an investor in Capricorn, net of fees assessed at the fund of funds level, is *closest* to:

- A 7.9%.
- B 8.0%.
- C 8.1%.

28 The following information applies to Rotunda Advisors, a hedge fund:

- \$288 million in assets under management (AUM) as of prior year-end
- 2% management fee (based on year-end AUM)
- 20% incentive fee calculated:
 - net of management fee
 - using a 5% soft hurdle rate
 - using a high-water mark (high-water mark is \$357 million)
- Current year fund return is 25%

The total fee earned by Rotunda in the current year is *closest* to:

- A \$7.20 million.
- B \$20.16 million.
- C \$21.60 million.

29 A hedge fund has the following fee structure:

Annual management fee based on year-end AUM	2%
Incentive fee	20%
Hurdle rate before incentive fee collection starts	4%
Current high-water mark	\$610 million

The fund has a value of \$583.1 million at the beginning of the year. After one year, it has a value of \$642 million before fees. The net return to an investor for this year is *closest* to:

- A 6.72%.
- B 6.80%.
- C 7.64%.

30 Ash Lawn Partners, a fund of hedge funds, has the following fee structure:

- 2/20 underlying fund fees with incentive fees calculated independently
- Ash Lawn fees are calculated net of all underlying fund fees
- 1% management fee (based on year-end market value)
- 10% incentive fee calculated net of management fee
- The fund and all underlying funds have no hurdle rate or high-water mark fee conditions

In the latest year, Ash Lawn’s fund value increased from \$100 million to \$133 million before deduction of management and incentive fees of the fund or underlying funds. Based on the information provided, the total fee earned by *all* funds in the aggregate is *closest* to:

- A \$11.85 million.

- B \$12.75 million.
 - C \$12.87 million.
- 31 Risks in infrastructure investing are *most likely* greatest when the project involves:
- A construction of infrastructure assets.
 - B investment in existing infrastructure assets.
 - C investing in assets that will be leased back to a government.
- 32 An investor in a private equity fund is concerned that the general partner can receive incentive fees in excess of the agreed-on incentive fees by making distributions over time based on profits earned rather than making distributions only at exit from investments of the fund. Which of the following is most likely to protect the investor from the general partner receiving excess fees?
- A A high hurdle rate
 - B A clawback provision
 - C A lower capital commitment
- 33 Until the committed capital is fully drawn down and invested, the management fee for a private equity fund is based on:
- A invested capital.
 - B committed capital.
 - C assets under management.
- 34 An analyst wanting to assess the downside risk of an alternative investment is *least likely* to use the investment's:
- A Sortino ratio.
 - B value at risk (VaR).
 - C standard deviation of returns.
- 35 An effective risk management process used by alternative investment funds *most likely* includes:
- A in-house valuations.
 - B internal custody of assets.
 - C segregation of risk and investment process duties.

SOLUTIONS

- 1 C is correct. Long-only equity funds are typically considered traditional investments and real estate and commodities are typically classified as alternative investments.
- 2 B is correct. The majority of private equity activity involves leveraged buyouts. Merger arbitrage and market neutral are strategies used by hedge funds.
- 3 B is correct. Hedge funds may use a variety of strategies (event-driven, relative value, macro and equity hedge), generally have a low correlation with traditional investments, and may take long and short positions.
- 4 A is correct. Alternative investments are characterized as typically having low levels of transparency.
- 5 A is correct. There are many approaches to managing alternative investment funds but typically these funds are actively managed.
- 6 A is correct. Investing in alternative investments is often pursued through such special vehicles as hedge funds and private equity funds, which have flexibility to use leverage. Alternative investments include investments in such assets as real estate, which is an illiquid asset, and investments in such special vehicles as private equity and hedge funds, which may make investments in illiquid assets and take short positions. Obtaining information on strategies used and identifying reliable measures of risk and return are challenges of investing in alternatives.
- 7 B is correct. Adding alternative investments to a portfolio may provide diversification benefits because of these investments' less than perfect correlation with other assets in the portfolio. As a result, allocating a portion of one's funds to alternatives could potentially result in an improved risk–return relationship. Challenges to allocating a portion of a portfolio to alternative investments include obtaining reliable measures of risk and return as well as selecting portfolio managers for the alternative investments.
- 8 C is correct. Hedge funds of funds have multi-layered fee structures, while the fee structure for a single hedge fund is less complex. Funds of funds presumably have some expertise in conducting due diligence on hedge funds and may be able to negotiate more favorable redemption terms than could an individual investor in a single hedge fund.
- 9 A is correct. Private equity funds and hedge funds are typically structured as partnerships where investors are limited partners (LP) and the fund is the general partner (GP). The management fee for private equity funds is based on committed capital whereas for hedge funds the management fees are based on assets under management. For most private equity funds, the general partner does not earn an incentive fee until the limited partners have received their initial investment back.
- 10 A is correct. Timberland offers an income stream based on the sale of timber products as a component of total return and has historically generated returns not highly correlated with other asset classes.
- 11 A is correct. Long–short positions are used by both types of hedge funds to potentially profit from anticipated market or security moves. Event-driven strategies use a bottom-up approach and seek to profit from short-term events typically involving a corporate action, such as an acquisition or a restructuring. Macro strategies seek to profit from expected movements in evolving economic variables.

- 12 A is correct. Margin calls can magnify losses. To meet the margin call, the hedge fund manager may be forced to liquidate a losing position in a security, which, depending on the position size, could exert further price pressure on the security, resulting in further losses. Restrictions on redemptions, such as lockup and notice periods, may allow the manager to close positions in a more orderly manner and minimize forced-sale liquidations of losing positions.
- 13 A is correct. The seed stage supports market research and product development and is generally the first stage at which venture capital funds invest. The seed stage follows the angel investing stage. In the angel investing stage, funds are typically provided by individuals (often friends or family), rather than a venture capital fund, to assess an idea's potential and to transform the idea into a plan. Mezzanine-stage financing is provided by venture capital funds to prepare the portfolio company for its IPO.
- 14 A is correct. A repeat sales index uses the changes in price of repeat-sale properties to construct the index. Sample selection bias is a significant drawback because the properties that sell in each period vary and may not be representative of the overall market the index is meant to cover. The properties that transact are not a random sample and may be biased toward properties that changed in value. Understated volatility and reliance on subjective appraisals by experts are drawbacks of an appraisal index.
- 15 B is correct. Publicly traded infrastructure securities, which include shares of companies, exchange-traded funds, and listed funds that invest in infrastructure, provide the benefits of transparent governance, liquidity, reasonable fees, market prices, and the ability to diversify across underlying assets. Direct investment in infrastructure involves a large capital investment in any single project, resulting in high concentration risks. Direct investment in infrastructure provides control over the assets and the opportunity to capture the assets' full value.
- 16 C is correct. Fundamental growth strategies take long positions in companies identified, using fundamental analysis, to have high growth and capital appreciation. Fundamental value strategies use fundamental analysis to identify undervalued companies. Market-neutral strategies use quantitative and/or fundamental analysis to identify under- and overvalued companies.
- 17 A is correct. It should be possible to identify the benchmark against which the fund gauges its performance in the hedge fund due diligence process. It should also be possible to establish the range of markets in which the fund invests as well as the fund's general strategy. Hedge funds consider their strategies, systems, and processes to be proprietary and are unwilling to provide much information to potential investors.
- 18 B is correct. Private equity funds can realize an immediate cash exit in a trade sale. Using this strategy, the portfolio company is typically sold to a strategic buyer.
- 19 C is correct. The higher the loan-to-value ratio, the higher leverage is for a real estate investment, which increases the risk to both debt and equity investors.
- 20 C is correct. A publicly traded infrastructure security, such as an exchange-traded MLP, provides the benefit of liquidity.
- 21 B is correct. A brownfield investment is an investment in an existing infrastructure asset, which is more likely to have a history of steady cash flows compared with that of a greenfield investment. Growth opportunities and returns are expected to be lower for brownfield investments, which are less risky than greenfield investments.

- 22 B is correct. Investing in an existing infrastructure asset with the intent to privatize, lease, or sell and lease back the asset is referred to as a brownfield investment. An economic infrastructure asset supports economic activity and includes such assets as transportation and utility assets. Hospitals are social infrastructure assets, which are focused on human activities.
- 23 B is correct. Many practitioners believe that liquidity discounts are necessary to reflect fair value. This has resulted in some funds having two NAVs - for trading and reporting. The fund may use average quotes for reporting purposes but apply liquidity discounts for trading purposes.
- 24 B is correct. Formative-stage financing occurs when the company is still in the process of being formed and encompasses several financing steps. Angel investing capital is typically raised in this early stage of financing.
- 25 B is correct. Roll yield refers to the difference between the spot price of a commodity and the price specified by its futures contract (or the difference between two futures contracts with different expiration dates). When futures prices are higher than the spot price, the commodity forward curve is upward sloping, and the prices are referred to as being in contango. Contango occurs when there is little or no convenience yield.
- 26 B is correct. The net investor return is 12.54%, calculated as:
- $$\begin{aligned} \text{End of year capital} &= \$250 \text{ million} \times 1.16 = \$290 \text{ million} \\ \text{Management fee} &= \$290 \text{ million} \times 2\% = \$5.8 \text{ million} \\ \text{Hurdle amount} &= 8\% \text{ of } \$250 \text{ million} = \$20 \text{ million;} \\ \text{Incentive fee} &= (\$290 - \$250 - \$20 - \$5.8) \text{ million} \times 20\% = \$2.84 \text{ million} \\ \text{Total fees to United Capital} &= (\$5.8 + \$2.84) \text{ million} = \$8.64 \text{ million} \\ \text{Investor net return:} &= (\$290 - \$250 - \$8.64) / \$250 = 12.54\% \end{aligned}$$
- 27 A is correct because the net investor return is 7.9%, calculated as:
- First, note that “1 and 10” refers to a 1% management fee, and a 10% incentive fee.
- $$\begin{aligned} \text{End of year capital} &= \text{GBP}140 \text{ million} + \text{GBP}80 \text{ million} = \text{GBP}220 \text{ million} \\ \text{Management fee} &= \text{GBP}220 \text{ million} \times 1\% = \text{GBP}2.2 \text{ million} \\ \text{Incentive fee} &= (\text{GBP}220 - \text{GBP}200) \text{ million} \times 10\% = \text{GBP}2 \text{ million} \\ \text{Total fees to Capricorn} &= (\text{GBP}2.2 + \text{GBP}2) \text{ million} = \text{GBP}4.2 \text{ million} \\ \text{Investor net return:} &= (\text{GBP}220 - \text{GBP}200 - \text{GBP}4.2) / \text{GBP}200 = 7.9\% \end{aligned}$$
- 28 A is correct. Rotunda earns a management fee of \$7.20 million but does not earn an incentive fee because the year-end fund value net of management fee does not exceed the high-water mark of \$357 million.

Rotunda fees:

$$\text{End-of-year AUM} = \text{Prior year-end AUM} \times (1 + \text{Fund return}) = \$288 \text{ million} \times 1.25 = \$360 \text{ million}$$

$$\$360 \text{ million} \times 2\% = \$7.20 \text{ million management fee}$$

$$\$360 \text{ million} - \$7.2 \text{ million} = \$352.8 \text{ million AUM net of management fee}$$

The year-end AUM net of fees does not exceed the \$357 million high-water mark. Therefore, no incentive fee is earned.

- 29 C is correct. The management fee for the year is

$$\$642 \times 0.02 = \$12.84 \text{ million.}$$

Because the ending value exceeds the high-water mark, the hedge fund can collect an incentive fee. The incentive fee is

$$\{\$642 - [\$610 \times (1 + 0.04)]\} \times 0.20 = \$1.52 \text{ million.}$$

The net return to the investor for the year is

$$[(\$642 - \$12.84 - \$1.52)/\$583.1] - 1 \approx 0.07638 \approx 7.64\%.$$

- 30 B is correct. Total fees paid to all funds (underlying funds and Ash Lawn) are \$12.75 million, consisting of underlying fund fees of \$9.26 million and Ash Lawn fees of \$3.49 million, calculated as follows:

Underlying fund fees:

$$\text{Management fee} = \$133 \text{ million} \times 0.02 = \$2.66 \text{ million.}$$

$$\text{Incentive fee} = (\$133 - \$100) \text{ million} \times 0.20 = \$6.60 \text{ million.}$$

$$\text{Total underlying fund fees} (\$2.66 + \$6.60) \text{ million} = \$9.26 \text{ million.}$$

Ash Lawn fees:

$$\text{AUM at end of year, net of underlying fund fees} = \$133 \text{ million} - \$9.26 \text{ million} = \$123.74 \text{ million.}$$

$$\text{Ash Lawn management fee} = \$123.74 \text{ million} \times 0.01 = \$1.24 \text{ million (rounded).}$$

$$\text{AUM net of underlying fund fees and Ash Lawn management fee} = (\$123.74 - \$1.24) \text{ million} = \$122.50 \text{ million (rounded).}$$

$$\text{Ash Lawn incentive fee} = (\$122.50 - \$100) \text{ million} \times 0.10 = \$2.25 \text{ million (rounded).}$$

$$\text{Total Ash Lawn fees} = (\$1.24 + \$2.25) \text{ million} = \$3.49 \text{ million (rounded).}$$

Total fees of underlying funds and Ash Lawn:

$$(\$9.26 + \$3.49) \text{ million} = \$12.75 \text{ million (rounded).}$$

- 31 A is correct. Infrastructure projects involving construction have more risk than investments in existing assets with a demonstrated cash flow or investments in assets that are expected to generate regular cash flows because the assets will be leased back to a government.
- 32 B is correct. A clawback provision requires the general partner in a private equity fund to return any funds distributed (to the general partner) as incentive fees until the limited partners have received back their initial investments and the contracted portion of the total profits. A high hurdle rate will result in distributions occurring only after the fund achieves a specified return. A high hurdle rate decreases the likelihood of, but does not prevent, excess distributions. Management fees, not incentive fees, are based on committed capital.
- 33 B is correct. Until the committed capital is fully drawn down and invested, the management fee for a private equity fund is based on committed capital, not invested capital.
- 34 C is correct. Downside risk measures focus on the left side of the return distribution curve where losses occur. The standard deviation of returns assumes that returns are normally distributed. Many alternative investments do not exhibit

close-to-normal distribution of returns, which is a crucial assumption for the validity of a standard deviation as a comprehensive risk measure. Assuming normal probability distributions when calculating these measures will lead to an underestimation of downside risk for a negatively skewed distribution. Both the Sortino ratio and the value-at-risk measure are both measures of downside risk.

- 35** C is correct. Investment risk should be monitored by a chief risk officer who is separated from the investment process. Risk factors monitored include leverage, sector, and individual position limits as well as counterparty risks. Independent (as opposed to in-house) valuation of underlying positions should be performed and reviewed on a regular basis. Third-party custody of assets can help reduce the chance of fraud.