2020 CFA®
PROGRAM EXAM PREP

SchweserNotes™   Level III

Alternative Investments and Private Wealth Management

eBook 4

KAPLAN) SCHWESER

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READING 26: HEDGE FUND STRATEGIES

Study Session 11

EXAM FOCUS

This reading describes some of the most important categories of hedge fund strategies and examines their investment characteristics and how these strategies are implemented. First, we discuss some unique characteristics of hedge funds and consider how various strategies might be categorized. Then, investment characteristics and implementation strategies are presented for six major hedge fund strategy categories: equity-related, event-driven, relative value, opportunistic, specialist, and multi-manager strategies. Next, we introduce a model for understanding the risk exposures of each of these strategies. The final LOS assesses the contribution of each hedge fund strategy to the return and risk of conventional stock and bond portfolios.

MODULE 26.1: OVERVIEW OF HEDGE FUND STRATEGIES

Video covering this content is available online.

Introduction

Hedge funds represent an important subgroup of alternative investment opportunities; however, they do come with many advantages and disadvantages.

Key features that distinguish hedge funds from traditional investments include:

- Lower regulatory and legal constraints.
- Flexibility to use short selling and derivatives.
- A larger investment universe.
- Aggressive investment exposures.
- Comparatively free use of leverage.
- Liquidity constraints for investors.
- Lack of transparency.
- Higher cost structures.

Perhaps the largest question to be answered is whether the high expense levels of hedge funds is made worthwhile by the return and diversification that hedge funds are intended to deliver.

Some asset managers seek out hedge funds as a source of alpha, which is never easy to come by. Others see hedge funds as a way to access top investing talent.

LOS 26.a: Discuss how hedge fund strategies may be classified.

CFA® Program Curriculum, Volume 5, page 7

Classifications of Hedge Fund Strategies

Hedge fund strategies are categorized based on the kinds of securities they invest in, the trading strategy used, and the kinds of risk exposures taken.

There are numerous ways to classify hedge funds, but in this topic review, we use the following six strategy categories:

1. *Equity related.* These fund strategies focus on stocks, and hence the primary source of risk is equity risk. Amongst this category of strategies are several subtypes, including long/short equity, dedicated short bias, and equity market neutral.

2. *Event driven.* These hedge fund strategies relate to corporate actions such as governance activities, mergers, acquisitions, bankruptcies, and other major business events. The main risks of these strategies are event risk; the possibility that outcomes will not unfold as expected, including the failure of a merger, credit downgrades, or bankruptcy. In the following LOSs, the event-driven hedge fund strategies that we will examine are merger arbitrage and distressed securities.

3. *Relative value.* These hedge fund strategies seek to profit from the relative valuation differences between securities. Credit and liquidity risks often complicate these strategies, because the valuation differences being exploited often relate to securities with different credit quality or liquidity. Two relative value strategies that will be considered further are fixed income arbitrage and convertible bond arbitrage.

4. *Opportunistic.* These strategies employ a top-down approach, often consider multiple asset classes, and vary with market conditions. The two opportunistic strategies that will be considered here are global macro and managed futures.

5. *Specialist.* These hedge fund strategies often require specialized market expertise or knowledge. Often the risks of these strategies arise due to exposure to specific sectors or unusual securities. The two such specialist strategies we will consider in this topic review are volatility strategies and reinsurance strategies.

6. *Multi-manager.* These strategies use other hedge fund strategies as building blocks, combining different strategies together and rebalancing exposures over time. The two types of multi-manager hedge funds we will consider are multi-strategy funds and funds-of-funds.

> **MODULE QUIZ 26.1**
>
> *To best evaluate your performance, enter your quiz answers online.*
>
> 1. A convertible bond arbitrage strategy is *most likely* classified as:
>   A. a specialist strategy.
>   B. an event-driven strategy.
>   C. a relative value strategy.
>
> 2. A managed futures hedge fund strategy is *most likely* classified as:
>   A. an opportunistic strategy.
>   B. a specialist strategy.
>   C. a relative value strategy.

MODULE 26.2: EQUITY, EVENT-DRIVEN, AND RELATIVE VALUE STRATEGIES

Video covering this content is available online.

Equity-Related Hedge Fund Strategies

Equity-related hedge fund strategies focus primarily on stock markets, and the majority of their risk profiles involve equity-oriented risk. Within this equity-related category, long/short equity, dedicated short bias, and equity market neutral are the main strategies that will be discussed further.

Long/Short Equity

Long/short (L/S) equity hedge funds are straightforward to understand. The fund manager purchases (takes long positions in) stocks that they think will rise in value, and sells (takes short positions in) stocks that they believe will fall in value.

Investment Characteristics

When L/S equity managers combine long and short positions, the resulting portfolio has a beta (i.e., market exposure) equal to the sum of the positive and negative betas of the various long and short positions.

L/S equity hedge funds generally do not seek to *eliminate* market exposure entirely. L/S funds will typically have a 40%–60% net long exposure, which is beneficial considering that markets generally trend upward over time.

Many L/S equity managers aspire to provide returns comparable to that of a long-only fund but with half the amount of standard deviation.

Strategy Implementation

Because successful implementation of an L/S equity strategy requires managers to identify overpriced and underpriced stocks, the majority of L/S equity funds take a sector-specific focus, choosing stocks from a particular industry that they are familiar with. They may also use index funds to achieve a desired exposure. L/S funds that are comparatively market neutral may need to use leverage to achieve worthwhile returns.

Role in a Portfolio

The goal of most L/S equity managers is to attempt to source alpha from long and short exposures to single stocks, while also benefitting from a moderate overall long exposure.

When considering an investment in an L/S equity fund, one should consider whether the investment is worthwhile given the potentially high fees. Taking a traditional long-only equity position may be a more efficient way to achieve a comparable beta exposure.

Dedicated Short Selling and Short-Biased

As the name suggests, **dedicated short-selling** funds seek out securities that are overpriced in order to sell them short. These managers look for poorly managed companies, firms in

declining market segments, or even firms with deceitful accounting. **Short-biased** managers use a similar strategy, except that the short position is somewhat offset by a long exposure.

One major challenge of being a short seller is that markets inevitably rise over time, which creates a tendency toward negative returns for shorts.

A notable subset of short selling is **activist short selling**, in which the fund manager not only takes a short position in a stock, but also presents research that contends that the stock is overpriced.

Investment Characteristics

Managers using short-biased strategies as well as dedicated short-selling strategies primarily aim to produce a negative correlation with conventional securities. Compared to other hedge fund strategies, expectations of return for short strategies tend to be lower. Compared to L/S equity hedge funds with their balanced beta exposures, short strategy funds tend to have greater volatility.

Strategy Implementation

Hedge fund managers go "short" a security by borrowing the security, selling it at the current market price, and then (ideally) profit by repurchasing the same security later at a lower price in order to return it to the lender.

The most challenging part of profiting from shorting stocks is finding securities that are going to lose value. Managers use a bottom-up approach to identify firms with unprofitable business models, bad management, too much debt, or even shady accounting.

A dedicated short seller takes on no long stock exposure; rather, they carefully select stocks for a pure short exposure, typically 60%–120% short. A dedicated short manager who wishes to temper the fund's market exposure will typically do this by holding cash.

Short-biased managers have a similar strategy; however, they may also take on some long exposure, while remaining net short, often 30%–60% net short.

For both dedicated short sellers and short-biased managers, relatively little leverage is used.

Role in a Portfolio

The primary goal of dedicated short-selling and short-biased funds is to produce returns that are uncorrelated (or negatively correlated) with the return of conventional portfolio assets. When successful, these negative correlations provide tremendous benefit to a portfolio.

However, this goal of negative correlation comes at a cost: expected returns for short strategies are relatively low. Historical performance of short strategies suggests that these strategies have produced returns that are unreliable and often underwhelming.

Equity Market Neutral

Equity market-neutral (EMN) strategies seek to attain a near-zero overall exposure to the stock market. They do this by taking long and short positions in various equities; the betas of these positions should sum to zero. The alpha of EMN strategies is intended to be derived from taking positions in securities that are temporarily mispriced.

Investment Characteristics

The overall goal of EMN funds is to create a portfolio that not only generates alpha, but is also relatively immune to movements in the overall market. Not surprisingly, without beta exposure, the returns of EMN funds tend to be modest. On the positive side, however, EMN funds can offer significant diversification and low volatility.

Strategy Implementation

Hedge fund managers for EMN funds take long positions in particular stocks thought to be temporarily undervalued and short positions in stocks seen as overvalued. When mean reversion eventually occurs, alpha should result.

While some EMN managers rely on intuition (i.e., discretionary managers), it is more common that they instead rely on a fixed set of rules to identify trade opportunities (i.e., quantitative managers).

Because EMN deliberately hedges away market beta, leverage is generally applied in order to achieve acceptable levels of return.

Popular subtypes of EMN funds include:

- **Pairs trading.** Two stocks with similar characteristics are identified that are respectively overvalued and undervalued. For example, the two securities might represent different share classes of the same firm, or one might be the stock of a firm and the other the stock of its holding company. In any case, the securities must be related but relatively mispriced.
- **Stub trading.** This EMN strategy involves going long and short shares of a subsidiary and its parent company. Generally the positions taken correspond to the percentage of the subsidiary owned by the parent.
- **Multi-class trading.** This strategy entails going long and short relatively mispriced share classes of the same firm, for example non-voting and voting shares. As the pricing of these shares reverts to their traditional valuations, profits can be made.

Besides investments in stocks, other instruments used to achieve a state of zero beta include options, stock index futures, or other kinds of derivatives.

Role in a Portfolio

EMN portfolios attempt to produce alpha without taking market beta risk. EMN strategies are of particular value in times when markets are volatile and performing poorly. The construction of EMN funds allows these funds to produce less volatility than funds that rely on beta as a source of return.

LOS 26.c: Discuss investment characteristics, strategy implementation, and role in a portfolio of *event-driven* hedge fund strategies.

CFA® Program Curriculum, Volume 5, page 22

Event-Driven Strategies

Event-driven hedge fund strategies are those that attempt to profit from predicting the outcome of corporate events, such as bankruptcies, mergers, restructurings, acquisitions, et

cetera. To do this, these funds take positions in securities of these corporations or in related derivatives.

The main risk that impacts event-driven strategies is event risk. The chance that the outcome of the event will not be the one anticipated. For example, a merger arbitrage hedge fund may anticipate that a particular merger will be successful and then suffer a large loss when the merger fails.

In this topic review, we will consider two types of event-driven hedge fund strategies in detail: merger arbitrage and distressed securities.

Merger Arbitrage

Merger arbitrage strategies are investment schemes that attempt to earn a return from the uncertainty that exists in the market in the time between an acquisition being announced and when the acquisition is completed.

Hedge fund managers in the merger arbitrage space profit by correctly anticipating the outcome of various deals. One way to view merger arbitrage is to compare it to writing insurance on an acquisition. If the acquisition is completed as planned, the hedge fund earns an insurance premium. If the transaction fails, however, then the hedge fund stands to lose money, analogous to an insurance company making a payout.

Investment Characteristics

In the case of a merger deal that fails, the price movements that originally occurred when the merger was announced will reverse: the price of the target will fall, and the price of the acquirer will rise. A hedge fund that had taken a position based on the merger succeeding is likely to suffer a significant cost when the deal fails unexpectedly; possibly in the order of a 40% loss. This kind of potential outcome gives merger arbitrage significant left-tail risk.

Compared to typical hedge fund strategies, merger arbitrage is more liquid.

Strategy Implementation

In the most common merger arbitrage scenario, the portfolio manager takes positions in the securities of the companies involved, with the expectation of a successful deal. For example, in a stock-for-stock deal, the hedge fund manager will typically purchase the stock of the target company and *short* the stock of the acquiring company in anticipation of profiting when the deal is completed.

Less often, the hedge fund manager may have the opinion that the merger will fail (for example, the deal might be blocked by the government because it would stifle competition.) In this scenario, the fund would take the opposite position to those described above.

In order to generate a worthwhile level of return, hedge funds pursuing a merger arbitrage strategy will typically apply 300%–500% leverage in order to achieve low-double-digit returns.

One specific variety of merger arbitrage involves cross-border mergers and acquisitions (M&A) where two countries and two regulatory authorities are involved. Such mergers are seen as more risky.

Role in a Portfolio

The Sharpe ratios of merger arbitrage strategies tend to be high, as these strategies usually produce relatively steady returns. However, on top of these steady returns is significant left-tail risk.

Distressed Securities

Hedge funds that pursue a **distressed securities** strategy take positions in the securities of firms that are in financial distress, including firms that are in bankruptcy or near bankruptcy. Firms may find themselves in this position for a number of reasons, including too much leverage, difficulty competing in their sector, or accounting issues. The securities of such a firm will often trade at greatly depressed prices.

Compounding the discounting of the securities of distressed firms is the fact that institutions such as insurance companies and banks are often not permitted to hold non-investment-grade securities. The selling of such securities can create significant pricing inefficiencies and can open up opportunities for hedge funds seeking profit.

When a firm is liquidated, the assets of the company are sold and then the various investors are paid back *sequentially* depending on their seniority (e.g., senior secured debtholders first, then junior secured debt, unsecured debt, convertible debt, preferred stock, and lastly common stock).

As an alternative to liquidation, a firm may instead be able to reorganize, which may involve renegotiating the company's liabilities. Holders of debt may be asked to exchange that debt for new equity or to agree to an extension of the maturity.

Investment Characteristics

Considering the various event-driven hedge fund strategies, returns of distressed securities investing strategy tend to be somewhat greater, though generally with larger variability of outcomes.

The lock-up periods for investors in event-driven hedge funds tend to be comparatively long (often allowing no redemptions for the first two years), reflecting the fact that the outcome of distressed security investments generally takes an extended period of time to value and exit.

Strategy Implementation

Distressed investing can take different forms. Some managers may make only a passive investment in the distressed securities, while other managers will attempt to acquire the majority of a certain class of security in order to take creditor control during bankruptcy.

Successful distressed securities investing requires a particularly broad range of skills in order to navigate the various legal aspects of the strategy, including the bankruptcy and reorganization proceedings.

While shorting distressed securities is a possibility, the majority of distressed investing takes the form of long investments.

Distressed investing generally makes low use of leverage.

Role in a Portfolio

Distressed securities investing involves moderately high levels of illiquidity due to the nature of the assets being purchased. The returns of distressed securities investing is higher relative to other event-driven strategies, though it can be somewhat unpredictable and sensitive to declines in the overall market.

LOS 26.d: Discuss investment characteristics, strategy implementation, and role in a portfolio of *relative value* hedge fund strategies.

CFA® Program Curriculum, Volume 5, page 29

Relative Value Hedge Fund Strategies

As the name suggests, **relative value** strategies attempt to exploit valuation differences between securities. The most common securities used in relative value strategies are hybrid convertible debt, as well as fixed-income securities.

When successful, relative value strategies will earn various premiums over time, including liquidity, credit, and volatility premiums, reflecting differences in liquidity or credit quality between securities. However, in times of turbulent markets, losses can occur.

Two relative value hedge fund strategies that we will consider in detail are fixed-income arbitrage and convertible bond arbitrage.

Fixed-Income Arbitrage

The idea behind **fixed-income arbitrage** strategies is to take advantage of temporary mispricing of fixed-income instruments, by going long comparatively undervalued securities, and going short comparatively overvalued securities. Idiosyncrasies that might be exploited include yield curve kinks or anticipated changes in the shape of the yield curve.

The securities may be fixed-income instruments of many types, including consumer debt, bank loans, corporate bonds, or sovereign bonds. Hedge fund managers take positions in these securities under the assumption that prices will revert toward their fair values.

Fixed-income arbitrage strategies often make use of significant leverage, in pursuit of sufficient levels of return.

Strategy Implementation

Two subtypes of fixed-income arbitrage strategies that we will consider in further depth are (1) yield curve trades and (2) carry trades.

- **Yield curve trades.** In this strategy, the hedge fund manager has a view of how the shape of the yield curve will evolve over time based on macroeconomic forecasts. The portfolio manager makes long and short investments in fixed-income instruments in order to profit from the anticipated yield curve steepening or flattening. As usual, the portfolio manager will profit when the prices of the long securities rise and the prices of the short securities fall. If the positions taken are in securities of different firms, then liquidity, credit, and interest rate risks will be present. For positions in securities of the same issuer, interest rate movements would be the main source of risk.

- **Carry trades.** In a carry trade, the portfolio manager shorts a low-yielding security and goes long a high-yielding security. The source of return here is twofold; first, from the yield differential, and second from the price changes as mean reversion occurs.

Because fixed-income securities tend to be priced fairly efficiently, the amount of profit that can be earned by fixed-income arbitrage is somewhat limited. As a result, substantial leverage is often applied to fixed-income arbitrage strategies. (400% leverage is not uncommon; even 1500% leverage is not unheard of.)

Investment Characteristics

Generally, the return to fixed-income arbitrage strategies are relatively small, so significant levels of leverage are used to increase the amount of return.

The liquidity of fixed-income arbitrage depends on the particular strategy employed and the kinds of fixed income instruments used. Strategies involving U.S. Treasuries are very liquid, while strategies that make use of mortgage-backed securities or foreign instruments, for example, are less liquid.

Role in a Portfolio

Return distributions for a fixed income arbitrageur tend to be similar to writing puts. If the trade unfolds as expected, the investor will earn a return from the spread narrowing, plus a return from positive carry. However, if the spread between the two instruments widens unexpectedly, the return to the investor may become quite negative.

One drawback to fixed income arbitrage strategies is that their highly leveraged nature can cause modest price volatility to lead to a domino effect of margin calls and deleveraging. For example, the Asian Financial Crisis of 1997 and the Russian Ruble Crisis of 1998 led to the collapse of the renowned hedge fund Long-Term Capital Management.

Convertible Bond Arbitrage

Convertible bonds are fixed-income debt securities that make regular coupon payments but can additionally be exchanged for a prearranged number of common stock shares. The bond-to-stock conversion is at the bondholder's discretion, though it is only permitted at certain points in the bond's life.

One way to view convertible bonds is as a regular bond plus a long call option on the corresponding stock.

Analyzing convertible bonds is extremely complex due to impacts from a number of factors.

The primary goal of **convertible bond arbitrage** strategies is generally to profit from purchasing the implied volatility of convertible bonds, which is often underpriced. To do this without taking on excess risk, convertible bond arbitrageurs will take on other positions to try to hedge out the delta and gamma risk of the convertible bond holdings.

Investment Characteristics

Convertible bond arbitrage managers encounter two primary sources of liquidity issues; first, because the strategy requires the manager to borrow and then short sell the underlying equity

and second, because the fixed income instruments being invested in are often complex niche products.

Strategy Implementation

Convertible arbitrage strategies generally exploit the fact that the options within convertible instruments usually exhibit low implied volatilities when compared to the historical volatilities of the equities that underlie the option. The challenge for the convertible bond arbitrage manager that invests in these convertibles is to hedge away the other sources of risk that are embedded in the convertible security including market risk, interest rate risk, and the credit risk of the bond issuer.

When a convertible bond's current conversion price is well below the conversion value, the out-of-the-money convertible bond will behave much like a straight bond. Conversely, when a convertible bond's conversion price is above the conversion value, the in-the-money call makes the convertible behave much like the corresponding stock.

Significant amounts of leverage are usually used to implement convertible bond strategies, often combining a three times long bond exposure with a two times short equity exposure. (The smaller short equity exposure stems from delta hedging the short stock exposure according to the delta of the long bond position.)

Role in a Portfolio

Convertible arbitrage strategies perform best during periods of normal market conditions, when liquidity is available, when volatility is modest, and when there is a good selection of convertible bonds being issued. Convertible arbitrage may not perform well in periods of illiquidity or weak credit.

MODULE QUIZ 26.2

To best evaluate your performance, enter your quiz answers online.

1. Considering various equity-related hedge fund strategies, a strategy that is *most likely* to apply relatively high levels of leverage is:
    A. an EMN strategy.
    B. a dedicated short strategy.
    C. a short-biased strategy.

2. An equity-related hedge fund strategy with gross exposures of 80% long and 35% short is *most likely* to be classified as:
    A. a dedicated short strategy.
    B. a short-biased strategy.
    C. a long/short equity strategy.

3. Relative to other hedge fund strategies, EMN strategies are *most likely* to:
    A. exhibit relatively modest returns.
    B. be vulnerable to periods of market weakness.
    C. earn return from alpha and beta risk.

4. An investment in distressed securities is *most likely* to be characterized by:
    A. a long bias.
    B. a high level of liquidity.
    C. a large amount of leverage.

5. In a sequential payoff during a liquidation, the security holder that is *most likely* to be paid off first is the holder of:
    A. junior secured debt.
    B. convertible debt.

C. preferred stock.

6. In implementing a convertible arbitrage strategy, the portfolio manager is *most likely* to take a position that is:
    A. long convertible bonds and short equity.
    B. long straight bonds and short convertible bonds.
    C. long convertible bonds and short straight bonds.

MODULE 26.3: OPPORTUNISTIC, SPECIALIST, AND MULTI-MANAGER STRATEGIES

LOS 26.e: Discuss investment characteristics, strategy implementation, and role in a portfolio of *opportunistic* hedge fund strategies.

CFA® Program Curriculum, Volume 5, page 37

Opportunistic Hedge Fund Strategies

Opportunistic hedge fund strategies are a broad class of investing approaches that attempt to extract profits using a wide range of techniques in a broad range of securities markets. Rather than being focused on individual securities, these strategies take a top-down approach to make macro investments on a global basis across regions, sectors, and asset classes.

The returns of opportunistic hedge fund strategies are generally impacted by market cycles, global developments, and international interactions. The risks will depend on the particular strategy and asset classes involved.

The implementation of opportunistic hedge fund strategies can be based on a number of broad techniques. Technical analysis uses past price changes to forecast future price movements. Strategies based on fundamentals, on the other hand, attempt to analyze security prices, markets, sectors, and the relationships between markets, using economic data as the input.

Managers using a **systematic** implementation of their strategies use computer algorithms and rules to determine which trades to make. Managers using a **discretionary** process instead use their instinct to determine when to trade.

We will consider two opportunistic strategies in detail: global macro and managed futures.

Global Macro Strategies

Managers of **global macro** strategy funds attempt to profit from making correct assessments and forecasts of various global economic variables including inflation, currency exchange rates, yield curves, central bank policies, and the general economic health of different countries.

Global macro managers use a broad range of security types and global asset classes to take positions on these views.

A global macro manager that can identify a global trend early and take a position can profit.

Investment Characteristics

Global macro managers can take positions that are either **thematic** (e.g., go long companies that are anticipated to benefit from expected interest rate hikes, and short companies that will be disadvantaged), or **directional** (e.g., buy firms that will benefit from forthcoming free trade deals.)

Unlike some hedge fund strategies, low-volatility-mean-reverting markets are not generally favorable for global macro returns.

Because global macro managers take investment positions based on their predictions of the future, there is significant potential for unsuccessful investments when global economies do not behave as expected or if unanticipated risks emerge. As a result, the returns of global macro funds tend to be uneven and volatile.

Strategy Implementation

Global macro strategies tend to be based on top-down analysis beginning with scrutiny of the global economy, then macro trends within economies, and so on, in order to identify potential opportunities.

Different global macro managers are likely to implement their strategies using very different techniques; for example, technical analysis vs. fundamental analysis, or discretionary implementation versus systematic implementation.

One commonality between global macro funds is that most tend to apply leverage, often representing 600% or 700% of fund assets.

A manager making directional predictions will generally use fundamental information to determine whether a particular asset is undervalued or overvalued on a historical basis. On the other hand, a manager using a relative value strategy will seek out securities that are overvalued or undervalued compared to one another.

Global macro managers tend to use discretionary approaches more than managed futures managers.

Role in a Portfolio

When added to a portfolio of traditional assets, a global macro hedge fund can bring a significant benefit (not only alpha, but also portfolio diversification).

A successful global macro manager will anticipate changes before other market participants and will then invest in a position and wait for the rest of the market to come around. This contrarian tendency can make an allocation to global macro strategies especially useful. For example, some global macro managers anticipated the United States' subprime mortgage crisis well before the housing bubble began to collapse in 2007.

During times of market stress, global macro funds have historically delivered right-tail skewed returns, which is extremely beneficial from a portfolio diversification perspective. However, this behavior cannot always be relied upon as such diversifying outcomes are not always realized.

Managed Futures

Hedge fund portfolio managers that pursue a **managed futures** strategy take long and short positions in a variety of derivatives contracts including futures, forwards, options on futures,

swaps, and sometimes currencies and commodities.

Managed futures strategies can be as simple as trading index futures on a particular sector, or it can involve very exotic contracts such as futures on the weather.

Investment Characteristics

Managed futures funds do not buy and sell assets; rather, they enter into futures contracts in order to gain the desired exposures.

Because of the mechanics of futures contracts (requiring only a small amount of upfront collateral), managed futures funds can easily apply great amounts of leverage. Typically, a fund will use perhaps 1⁄8 of its capital as collateral on futures contracts. The other 7⁄8 or so will be invested in some highly liquid security (such as short-term government bonds) that will serve as collateral for the futures clearinghouse.

Managed futures funds are extremely liquid. The reason for this is that futures contracts themselves are highly liquid; they trade globally and continuously. Going long or short futures allows a hedge fund manager easy access to exposures across a range of asset classes.

One downside of the popularity of managed futures strategies is that **crowding** has occurred. Many market participants pursue the same trades and use similar signals, and execution slippage sometimes occurs.

Strategy Implementation

There are a number of ways to implement managed futures strategies.

In perhaps the most popular method, **time-series momentum (TSM)** trend following, portfolio managers simply follow momentum. They buy securities that have been rising in price and sell securities that have been falling.

Another similar methodology is **cross-sectional momentum (CSM)** strategies, which is carried out within a particular asset class (a *cross section* of assets). Again, the securities rising fastest are purchased and falling securities are shorted.

The high liquidity of futures contracts allows hedge fund managers to pursue a very wide selection of trading strategies. Generally, portfolio managers will rely on a signal trigger, most often based on volatility or momentum, to prompt the manager to trade.

In addition to using signals to indicate when to enter a trade, portfolio managers will also have rules for closing a position. Exit methodologies can be based on:

- Price target.
- Momentum reversal.
- Time.
- Trailing stop-loss.
- Some combination of these approaches.

The goal of managed futures strategies is to develop rules and signals that work well not only on historical data but also in real-world use. However, the more portfolio managers are using similar signals, the less effective these signals will become.

Managed futures strategies are typically implemented using systematic approaches, whereby the portfolio manager relies on signals produced by a computer program or model.

The size of positions taken are usually based on factors such as correlation and volatility.

Role in a Portfolio

Perhaps the most appealing feature of managed futures is their interaction with other investments. Overall, managed futures have very little correlation with traditional equity and fixed-income assets. The result is that when added to a portfolio, managed futures will generally improve the total risk-adjusted return.

This diversifying characteristic has proven its worth during times of market stress. While other strategies exhibit negative skewness during such periods, the positive right-tail skewness of managed futures provides a significant advantage.

LOS 26.f: Discuss investment characteristics, strategy implementation, and role in a portfolio of *specialist* hedge fund strategies.

CFA® Program Curriculum, Volume 5, page 45

Specialist Strategies

Portfolio managers for **specialist hedge fund strategies** use their knowledge of a particular market to pursue niche investment opportunities. The purpose of pursuing specialist strategies is to generate returns that are uncorrelated with traditional assets and produce high risk-adjusted returns. The risks of such strategies are often unique to the particular niche securities being invested in.

Two such strategies that we will consider in detail are volatility trading and reinsurance/life settlements.

Volatility Trading

Once an esoteric pursuit, **volatility trading** has evolved over recent years to become a recognized investable asset.

Volatility trading hedge fund managers will trade volatility-related assets globally, across countries and across asset classes, in order to exploit perceived differences in volatility pricing. The overall goal is to purchase underpriced volatility and sell overpriced volatility.

For example, the price of volatility in Asia has traditionally been lower than in other regions. Even though the Tokyo Stock Exchange traditionally has higher volatility than the New York Stock Exchange, implied volatility is usually cheaper in Tokyo than it is in New York.

Another volatility trade is to act as the counterparty to market participants that consistently seek long volatility. Because the negative correlation between stock market returns and equity volatility is high, equity investors seek to buy volatility as a hedge. A hedge fund that is willing to sell volatility will earn an insurance-like premium as compensation for taking on this risk; however, such a strategy can unravel in a dramatic fashion.

In the U.S. markets, the most common volatility futures are contracts on the **VIX index**, which tracks the 30-day implied volatility of the S&P 500 index. VIX contracts tend to be mean reverting because high volatility naturally tends to dissipate over time.

Strategy Implementation

Hedge fund managers wishing to pursue volatility trading have several options.

One possibility is to build various option strategies, such as straddles, calendar spreads, bull spreads, or bear spreads, using basic exchange-traded options.

A second possibility is to make use of over-the-counter (OTC) options, which are customized to meet the portfolio manager's specific needs. A drawback of this method, however, is that it introduces counterparty risk plus additional liquidity issues.

A more direct way to trade volatility is to use futures on the VIX index. An advantage of this method is that it is a very direct way to express a view on volatility, without the need for hedging. There are disadvantages though. First, the mean-reverting nature of the VIX index's price and second, many traders and investors crowd into the VIX futures in order to sell volatility and capture the associated premiums, making it difficult to profit from that strategy.

A fourth method of implementing a volatility trading strategy is to enter into an OTC **volatility swap** or alternatively a **variance swap**. These derivatives provide a relatively pure exposure to volatility. (Note that the name "swap" here is somewhat misleading. Volatility swaps and variance swaps are actually forward contracts with a payoff based on the difference between observed or realized variance multiplied by some notional amount).

Investment Characteristics

The investment characteristics of volatility trading will vary depending on the securities invested in and the positions taken.

Investors that take a short position in volatility will earn premiums and generally produce stable returns under average market conditions. A long position in volatility will display positive convexity, which can be valuable as a hedge.

The liquidity of a volatility trading strategy will depend on the instruments used. Futures and options based on VIX tend to be extremely liquid, and exchange-traded volatility options are liquid as well (especially when the tenor is short). OTC contracts on the other hand are generally less liquid.

The use of futures contracts makes it easy to apply leverage to a volatility trading strategy. The convexity of volatility derivatives means that sometimes large gains can be made from long volatility strategies while taking little risk.

Because of their unique nature, benchmarking of volatility trading strategy performance can be difficult.

Role in a Portfolio

In a portfolio, a long volatility strategy is a potent diversifier, because stock market volatility is highly negatively correlated with market returns. The downside of maintaining a long volatility position, however, is that a premium must be paid to the volatility seller.

Reinsurance/Life Settlements

In recent years, numerous hedge funds have formed to take advantage of attractive investment opportunities related to insurance policies. In a typical **life settlement** transaction,

an insured person will sell (generally through a broker) their insurance policy to a hedge fund. After the investor pays the insured for the policy, the hedge fund then will be liable for the premium payments and will also receive the death benefit upon the passing of the insured.

Individuals will sell their life insurance contracts when they feel that they no longer benefit from the agreements. Individuals who purchased life insurance policies are incentivized to sell their policies to third-party brokers because those firms will oftentimes pay more for the policy than the issuing insurance company will pay for a surrendered policy.

Catastrophe risk **reinsurance** is another area where hedge funds are increasingly investing. **Catastrophe insurance** covers the holder against earthquakes, tornadoes, hurricanes, floods, and the like. In order to diversify and decrease risk, insurance companies in their normal course of business will sell off some of their risk to reinsurance companies, who may then lay these risks off on hedge funds in exchange for capital. Reinsurance can be a rewarding investment for a hedge fund if sufficient diversity can be obtained (e.g. vary by geography and types of insurance) if the insurance company provides sufficient loan loss reserves and if the policy premiums are adequate. When considering an investment in catastrophic insurance, the hedge fund considers both typical and worst-case outcomes and compares this to the insurance premiums to be received. Geographic diversity is important, as a specific catastrophic event will tend to effect only a particular part of the world.

Investment Characteristics

Strategies that involve investments in insurance contracts are illiquid, because insurance policies are somewhat difficult to sell after initiation.

Strategy Implementation

The term "life settlement" refers to a secondary market transaction on an insurance policy. A hedge fund that invests in life settlements will analyze various pools of life insurance contracts that brokers offer, and invest in the ones that are predicted to offer an attractive return. After investing, the hedge fund then becomes the beneficiary of these contracts. The investment is successful if the present value of the future insurance payout exceeds the payments made by the hedge fund.

In selecting which insurance policies to invest in, a hedge fund will seek out policies with the following characteristics:

- The purchase price of the policy is low.
- The ongoing premium payments are low.
- The insured person is likely to die relatively soon.

One major prerequisite to profiting from life settlements is to develop an accurate alternative estimate of life expectancies. Appraising a life settlement requires a significant amount of skill and knowledge and requires comparing individual policyholders' outlooks to actuarial averages.

Role in a Portfolio

A very appealing feature of insurance investments in a portfolio is that the risk inherent in these strategies is almost entirely uncorrelated with market risks and business cycles. For example, floods and earthquakes have little or no correlation to the financial markets.

Thus, hedge funds that invest in such assets can add alpha to a portfolio while simultaneously adding return diversification.

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Multi-Manager Hedge Fund Strategies

Up until this point in the topic review, we have been considering various individual hedge fund strategies. In reality, most investors invest not just in a single hedge fund strategy, but in a diverse set of strategies.

The notion behind multi-manager hedge funds is to assemble in a deliberate way a portfolio of diverse hedge fund strategies and to adjust the holdings strategically over time.

The best-known varieties of multi-manager hedge funds are funds-of-funds and multi-strategy funds.

Fund-Of-Funds

A **fund-of-funds (FoF)** takes capital from various individual investors and invests in a number of different hedge funds, generally each pursuing different strategies.

FoF can provide investors with a number of benefits:

- Diversification across hedge fund strategies.
- Expertise in individual manager selection.
- Strategic allocation and style allocation.
- Due diligence.
- Occasional value-added tactical decisions.
- Currency hedging.
- Leverage at the portfolio level.
- Better liquidity terms vs. individual hedge funds.
- Access to certain closed hedge funds.
- Economies of scale for monitoring.
- Research expertise.
- Potential liquidity efficiencies.
- Potentially valuable concessions from the underlying funds.

FoF also have the following disadvantages:

- A double layer of fees for the investor.
- Lack of transparency into individual hedge funds.
- No performance fees netting.
- Additional principal–agent issues.

Investment Characteristics

Individual hedge funds have traditionally charged a "**2 and 20**" fee structure, indicating management fees of 2% plus performance incentive fees of 20%. On top of this, FoF have historically added a 1% management fee, plus a further 20% incentive fee on the *total* FoF portfolio. (Though over time, these FoF fees have become negotiable and generally smaller.)

One important feature that FoF serve is making an investment in hedge funds practical for smaller investors, such as small institutions and for moderately wealthy individuals.

Hedge funds almost always require significant initial investments; typically $1 million. Achieving a diversified exposure to a number of such funds poses a difficulty for smaller investors, as an investment in 20 hedge funds might require a cumulative minimum investment on the order of $20 million. Furthermore, performing due diligence on 20 different hedge funds would require far more resources than most individual investors could muster. (Not to mention complications such as tax reporting on 20 investments.)

Using a FoF, on the other hand, a smaller investor can typically access a diversified hedge fund exposure for as little as $100,000. In this way, FoF serve as an entry point into hedge fund investing.

Aside from providing an accessible path into hedge funds, FoF provide a number of other advantages. For example, FoF may provide access to high-profile managers whose funds are otherwise closed to new investors. Also, the larger size of FoF may allow the fund to obtain valuable concessions from the underlying funds' management.

Liquidity can be a challenge for portfolio managers of funds-of-funds. Typically, a FoF will require a one-year initial **lock-up** for investors then will allow somewhat greater liquidity afterwards (e.g., monthly or quarterly). However, the underlying funds may have even stricter limits on liquidity, leaving a FoF manager in a potential squeeze.

Another drawback of funds-of-funds relates to potential netting risk, whereby investors could be required to make significant incentive payments to successful underlying funds, even if the overall performance of a FoF is poor.

Strategy Implementation

The fund-of-funds strategy is normally implemented as follows:

1. Use fund databases plus personal introductions to become familiar with hedge funds available for investment.
2. Choose an appropriate strategic allocation to different hedge fund strategies.
3. The manager selection process is initiated, using both top-down and bottom-up techniques.
4. For each hedge fund strategy, consider a number of candidates following that strategy.
5. Interview the candidate hedge fund managers.
6. Review relevant materials such as audit reports.
7. Examine the funds' personnel, operational processes, and risk management.
8. Negotiate with the individual fund managers for lower fees, improved liquidity, et cetera.
9. After the various funds are approved and included in the FoF, an ongoing monitoring process begins, intended to detect major personnel changes, style drift, et cetera.

The FoF's strategic allocation determines the percentage of total capital that will be invested in each hedge fund style. In addition to this strategic allocation is a tactical allocation, whereby the FoF manager will at various times underweight or overweight the various hedge fund strategies to reflect the FoF manager's perception of a changing market environment.

Role in a Portfolio

When a FoF manager takes a number of relatively uncorrelated hedge funds and combines them together in the same portfolio, a FoF should produce a number of advantages: greater diversification, steady returns, less concentrated exposure to risks, less volatility, and less exposure to the downside risk of any individual fund manager.

Multi-Strategy Hedge Funds

Like a FoF, **multi-strategy** hedge funds are funds that hold a number of other hedge funds where these various funds are pursuing diverse strategies. Also similar to a FoF, multi-strategy hedge funds are intended to use this diversification of strategy to produce steady low-volatility returns.

Unlike a FoF, the sub-funds in multi-strategy hedge funds are run by the same organization, rather than being managed by different hedge fund firms.

Investment Characteristics

The diversification of multi-strategy funds is intended to produce steady returns and low volatility.

Multi-strategy funds share some investment characteristics with funds-of-funds, but also there are significant differences. For example, the **operational risks** of a multi-strategy fund are not well-diversified as is with a FoF, because all of the operational processes of multi-strategy funds are performed under the same roof.

Furthermore, the diversity of strategies represented by the different funds in multi-strategy funds are often somewhat limited, because the managers employed by a specific multi-strategy fund tend to have somewhat similar investment viewpoints and methods.

A major advantage of multi-strategy funds over a FoF is the speed and relative ease with which **tactical** allocations can be made. Because each of the multi-strategy funds are managed in-house, it is relatively easy for the multi-strategy manager to reallocate investment from one strategy to another. The high internal transparency and fast response time makes tactical reallocations of multi-strategy funds practical, which could explain why multi-strategy funds have historically been seen as superior to funds-of-funds in protecting investments.

Investor fees for a multi-strategy fund are often more attractive than those of a FoF. While FoF investors are subject to netting risk (where hefty performance fees can be paid to some sub-fund managers, despite overall poor FoF performance), multi-strategy funds are more likely to absorb this netting risk internally. In this arrangement, the investor only pays an incentive fee on the total fund performance. (Some multi-strategy funds though do use a FoF-like "pass-through" fee model, which will expose investors to netting risk.)

Like a FoF, multi-strategy funds generally limit investor liquidity using redemption periods and initial lock-ups. Multi-strategy funds additionally often enforce limits on the amount of

redemption each quarter.

Strategy Implementation

Multi-strategy funds carry out their approach by making investments in a number of varying hedge fund strategies.

One key advantage of multi-strategy funds is their ability to make tactical reallocations in addition to a fund's strategic allocation. Furthermore, the multi-strategy fund's internal teams are likely to be well informed about why and when capital and leverage should be reallocated, versus a FoF manager for whom the various funds are more opaque.

Risk management can also be more effective with a multi-strategy fund. Unlike FoF managers, multi-strategy managers should have an excellent view of correlations and common risks between the various funds.

Multi-strategy funds also enjoy efficiencies that come from multiple hedge fund teams sharing the same administrative resources.

Multi-strategy funds often will make greater use of leverage than the average FoF. Normally, leverage in multi-strategy funds does not pose much of a risk; however, during periods of market stress, small sources of danger can become significant left-tail risks that threaten the survival of the fund. (This kind of scenario lead to the demise of Ritchie Capital in 2005 and Amaranth Advisors in 2006.)

Multi-strategy funds generally have more varied performance than a FoF.

Role in a Portfolio

Multi-strategy funds are intended to improve an investment portfolio by adding diversification and steady, low-volatility returns.

Historically, multi-strategy funds have generally performed better than have funds-of-funds, due to a superior fee structure and greater ability to execute on tactical asset allocation. However, the leveraged nature of multi-strategy funds can sometimes lead to a left-tail blow-up during times of stress.

MODULE QUIZ 26.3

To best evaluate your performance, enter your quiz answers online.

1. Considering global macro strategies and managed futures strategies, it would be *most accurate* to state that:
   A. managed futures strategies use more discretionary approaches.
   B. global macro strategies use more systematic approaches.
   C. both strategies tend to be highly liquid and use high leverage.

2. During periods of market stress:
   A. managed futures and global macro both exhibit right-tail skewness.
   B. managed futures strategies exhibit left-tail skewness.
   C. global macro strategies exhibit left-tail skewness.

3. Considering the correlation between equity volatility and equity market returns, the two measures are *most likely* to be:
   A. highly positively correlated.
   B. predominantly uncorrelated.
   C. highly negatively correlated.

4. A hedge fund is *most likely* to purchase a pool of life insurance policies that has high:

- A. surrender value.
- B. ongoing premium payments.
- C. likelihood of the insured person dying soon.

5. Compared to a multi-strategy fund, a fund-of-funds is *most likely* to offer the investor a more:
   - A. effective tactical asset allocation.
   - B. attractive fee structure.
   - C. diverse strategy mix.

6. Compared to a multi-strategy fund, a fund-of-funds is *most likely* to offer an investor lower:
   - A. transparency.
   - B. netting risks.
   - C. leverage.

MODULE 26.4: FACTOR MODELS AND PORTFOLIO IMPACT OF HEDGE FUNDS

LOS 26.h: Describe how factor models may be used to understand hedge fund risk exposures.

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Factor Models

Analysis of Hedge Fund Strategies

In this LOS, we will consider the use of a **conditional linear factor model** to quantify the risk exposures of various hedge fund strategies.

By conditional, we mean a model that takes into account that a fund may behave one way during normal market conditions and behave differently during a period of market turbulence (such as the global financial crisis of 2007–2009).

By determining a fund's actual risk exposures, events such as the widespread closure of hedge funds after the global financial crisis are less likely.

Conditional Factor Risk Model

Suppose we use the following conditional linear factor model to explain the return of hedge fund *i* in period *t*:

$$(\text{Return on HF}_i)_t = \alpha_i + \beta_{i,1}(\text{Factor 1})_t + \beta_{i,2}(\text{Factor 2})_t + \ldots + \beta_{i,K}(\text{Factor K})_t + D_t\beta_{i,1}(\text{Factor 1})_t + D_t\beta_{i,2}(\text{Factor 2})_t + \ldots + D_t\beta_{i,K}(\text{Factor K})_t + (\text{error})_{i,t}$$

where:

α_i = intercept for hedge fund *i*

$\beta_{i,K}(\text{Factor K})_t$ = exposure during *normal* periods to risk factor *K*

D_t = dummy variable that equals zero during normal periods, and one during a financial crisis

$D_t\beta_{i,K}(\text{Factor K})_t$ = *incremental* exposure to risk factor K during financial crisis periods

$(\text{error})_{i,t}$ = random error with zero mean

Any returns not explained by the model's risk factors would be attributed to either omitted risk factors, alpha (i.e., hedge fund manager skill), or randomness (error).

Hasanhodzic and Lo (2007) used the following six factors:

1. *Equity risk (SNP500):* S&P 500 total return index.
2. *Interest rate risk (BOND):* Bloomberg Barclays Corporate AA Intermediate Bond Index.
3. *Currency risk (USD):* U.S. Dollar Index.
4. *Commodity risk (CMDTY):* Goldman Sachs Commodity Index (GSCI) total return.
5. *Credit risk (CREDIT):* Spread between Moody's Baa and Aaa corporate bond yields.
6. *Volatility risk (VIX):* CBOE Volatility Index (VIX).

A **stepwise regression** process is useful for creating linear conditional factor models that avoid multicollinearity problems, by avoiding the use of highly correlated risk factors. When this stepwise regression process was run by the authors of the original reading, the process resulted in the BOND and CMDTY factors being dropped due to multicollinearity issues. (CREDIT and SNP500 respectively produced higher adjusted R^2.)

This left the following four factors for measuring risk exposures:

1. Equity risk (SNP500).
2. Currency risk (USD).
3. Credit risk (CREDIT).
4. Volatility risk (VIX).

Each hedge fund strategy has different exposures to these various risk factors. These risk factors stem from taking long or short positions in financial instruments that are exposed to these risks.

For example, arbitrage strategies often are generally exposed to credit spread risk and market volatility risk. Event-driven strategies and L/S equity strategies generally have significant exposure to equity (market beta) risk.

LOS 26.i: Evaluate the impact of an allocation to a hedge fund strategy in a traditional investment portfolio.

CFA® Program Curriculum, Volume 5, page 71

In this LOS, we assess the effect of reallocating a portion of a traditional investment portfolio to a hedge fund strategy.

Specifically, we will consider what happens to the return and risk of the total portfolio when we add a 20% allocation to each of the hedge fund strategies discussed previously. The hedge fund allocation will be added to a conventional 60% stock/40% bond investment portfolio.

Portfolio Contribution of Hedge Fund Strategies

When the previously mentioned 20% allocation to hedge funds is added to a traditional 60% stock/40% bond investment portfolio, the resulting allocation is 48% stock, 32% bond, and 20% hedge fund.

Performance Contribution to a 60/40 Portfolio

When we add a 20% allocation to most hedge fund strategies to a traditional portfolio, the general result is the following:

- Total portfolio standard deviation decreases.
- Sharpe ratio increases.
- Sortino ratio increases.
- Maximum drawdown decreases in approximately one-third of portfolios.

The interpretation of these results is that hedge fund strategies generally increase risk-adjusted return and provide diversification to a traditional portfolio of stocks and bonds.

Risk-Adjusted Performance

The **Sharpe ratio** is one risk-adjusted measure of performance. The risk measure used to calculate the Sharpe ratio is standard deviation, so both downside and upside standard deviation result in a lower Sharpe ratio.

The **Sortino ratio** is a similar risk-adjusted measure of performance; however, only downside deviations are considered to reflect risk. Risk is measured as variability *below* a predefined level of return. Because of the left-tail risk present in many hedge fund strategies, the Sortino ratio is generally seen as a superior measure of the risk-adjusted performance of hedge funds.

When 20% allocations to various hedge fund strategies are added to the traditional stock/bond portfolio, notably high Sharpe ratios are also achieved from allocations to these strategies:

- Systematic futures hedge funds.
- Distressed securities.
- Fixed-income arbitrage.
- Global macro.
- Equity market neutral.

The highest Sortino ratios were attained via allocations to the following hedge fund strategies:

- Equity market neutral.
- Systematic futures.
- L/S equity.
- Event driven.

Allocations to the following strategies was found to be effective in generating superior risk-adjusted performance, based on the comparatively higher Sharpe and Sortino ratios:

- Systematic futures.
- Equity market neutral.
- Global macro.
- Event-driven hedge fund strategies.

On the other hand, it was observed that the following fund strategies do not significantly enhance risk-adjusted performance:

- Fund-of-funds.
- Multi-strategy.

While all of the hedge fund strategies expose the overall portfolio to various kinds of additional portfolio risks, allocating a portion of a stock/bond portfolio to hedge funds generally reduces risk and increases returns.

Risk Metrics

One key reason for investors to allocate a portion of their portfolio to hedge fund strategies is to reduce risk.

Standard Deviation

Perhaps not surprisingly, it was found that the following strategies resulted in the lowest standard deviations of returns for the overall portfolio:

- Dedicated short-biased.
- Bear market neutral.

These funds also produced notably low standard deviations:

- Systematic futures.
- FoF: macro/systematic.
- Equity market neutral.

The risk-reduction ability of these strategies has been found to be substantial. Not surprisingly, they are also some of the strategies that most improve risk-adjusted returns.

Funds that were found to have little positive impact on reducing standard deviations of the overall portfolio include:

- Event-driven: distressed securities.
- Relative value: convertible arbitrage.

An explanation for event-driven: distressed securities' lack of ability to reduce standard deviation is that these securities tend to take long positions in securities, and outcomes are either mild successes or grand failures.

Relative value: convertible arbitrage do little to improve standard deviation likely because their leveraged nature becomes a liability during times of market volatility.

Drawdown

Drawdown is defined as the peak-to-trough decline for a portfolio, generally quoted as the percentage drop between a peak and the subsequent trough. The **high-water mark** refers to the maximum value the portfolio has ever reached.

Drawdown is useful for quantifying the risk and past performance of various investment strategies, and for comparing one strategy's risk to another.

The hedge fund strategies that produced the smallest maximum drawdowns are various opportunistic strategies:

- Global macro.
- Systematic futures.
- Merger arbitrage.
- Equity market neutral.

Use of the conditional risk model can show that these strategies perform relatively well during periods of market crisis because they have minimal exposure to credit risk or equity. Furthermore, these strategies benefit from their liquid nature. These properties make opportunistic strategies useful diversifiers for traditional assets.

Other hedge fund strategies had entirely dissimilar drawdown performance. These strategies did little to mitigate the traditional portfolio's maximum drawdown:

- L/S equity.
- Event-driven: distressed securities.
- Relative value: convertible arbitrage.

These results are somewhat expected. Using the conditional risk model, we can demonstrate that these particular strategies have significant exposure to equity risk, and furthermore during crisis periods they have significant exposure to credit risk as well.

MODULE QUIZ 26.4

To best evaluate your performance, enter your quiz answers online.

1. Conditional linear factor models used to understand hedge fund risk exposures are *most likely* to use factors including:
   A. liquidity risk, operational risk, valuation risk, and systemic risk.
   B. interest rate risk, commodity risk, margining risk, and concentration risk.
   C. equity risk, credit risk, currency risk, and volatility risk.

2. Adding a 20% allocation of a hedge fund strategy to a traditional 60%/40% portfolio is *most likely* to increase the total portfolio's:
   A. standard deviation.
   B. maximum drawdown.
   C. Sortino ratio.

3. The risk-adjusted performance of a traditional 60%/40% portfolio is *most likely* to be improved by adding an allocation to a hedge fund using the strategy of:
   A. equity market neutral.
   B. fund-of-funds.
   C. multi-strategy.

LOS 26.a

Hedge fund strategies are classified based on the instruments they invest in, the philosophy followed, and the kinds of risk exposures taken.

This reading classifies hedge fund strategies into the following six categories:

1. Equity related.
2. Event driven.
3. Relative value.
4. Opportunistic.
5. Specialist.
6. Multi-manager.

LOS 26.b

Long/short equity. This strategy generates alpha via careful stock picking. L/S funds are typically liquid, and generally net long. Equity L/S managers aspire to the returns of a long-only approach but with lower standard deviations. The more market-neutral the approach, the more leverage is likely to be applied.

Dedicated short-selling and short-biased strategies. These two strategies have a negative correlations to traditional assets and modest return goals. The focus is on stock picking using minimal leverage. Dedicated short strategies are generally 60%–120% short at all times, while short-biased strategies are typically 30%–60% net short with some long exposure. Short-biased managers moderate short beta with some long exposure (and cash).

Equity market-neutral (EMN). These strategies attempt to profit from short-term mispricing between securities. Beta risk is minimal, making EMN strategies attractive in periods of market weakness. Most managers are quantitative (vs. discretionary). High leverage is usually used.

LOS 26.c

Merger arbitrage. This strategy attempts to profit by taking positions on a corporate takeover. Merger arbitrage returns are usually insurance-like with a high Sharpe ratio. However, left-tail risk is present. Negative returns can occur if a merger deals unexpectedly fails. Some leverage is usually applied to generate meaningful returns. It is a relatively liquid strategy.

Distressed securities. These strategies focus on firms in bankruptcy or facing other financial stress and seek out mispriced securities. Distressed securities strategies are usually long biased with high illiquidity and moderate or low leverage. Returns tend to be high compared to other event-driven strategies.

LOS 26.d

Fixed-income arbitrage. This strategy attempts to profit from the mispricing of bonds. Sub-strategies include yield curve trades and carry trades. Fixed-income arbitrage usually uses high leverage.

Convertible arbitrage. These strategies attempt to extract "underpriced" implied volatility from long convertible bonds. Convertible arbitrage works best when there is high convertible issuance, adequate market liquidity, and moderate volatility. Liquidity issues may arise from convertibles being somewhat illiquid. Convertible arbitrage managers generally run about 300% long versus 200% short.

LOS 26.e

Opportunistic strategies tend to be highly liquid and use high leverage.

Global macro. These strategies use discretionary approaches and a range of financial instruments to exploit trends in global financial markets. Global macro strategies offer diversification during periods of stress but with mixed outcomes.

Managed futures. In these strategies, a portfolio of futures contracts is actively managed using systematic approaches to provide portfolio and market diversification. Managed futures strategies often exhibit right-tail skew during market turmoil.

LOS 26.f

Specialist hedge fund strategies operate in market niches in order to generate uncorrelated returns. Success with these strategies usually requires specialized knowledge.

Volatility traders. These strategies seek to profit from changes in the term structure of volatility. OTC options can be used to create bull spreads, bear spreads, straddles, and calendar spreads. Alternatively, other instrument including VIX futures, volatility swaps, and variance swaps can be used.

Life settlements. In these strategies, pools of life insurance contracts are purchased, and the hedge fund becomes the beneficiary. The hedge fund manager looks for policies with low surrender value, low ongoing premium payments, and high probability that the insured person will die soon.

LOS 26.g

Multi-manager hedge fund strategies use strategy diversification in an attempt to produce low-volatility, steady returns.

Funds-of-funds. This strategy involves a hedge fund that invests in other hedge funds. Funds-of-funds can offer a very broad strategy mix but can suffer from a lack of transparency, slower tactical execution, and can also expose the FoF investor to netting risk.

Multi-strategy funds. In this hedge fund strategy, a single hedge fund pursues a combination of strategies all under one roof. Compared to funds-of-funds, multi-strategy funds offer a better fee structure and faster tactical asset allocation, though operational risks are less diversified.

LOS 26.h

Conditional linear factor models can be useful for analyzing hedge fund strategies in terms of their risk factor exposures. The curriculum makes use of a specific four-factor model (incorporating equity risk, currency risk, volatility risk, and credit risk factors) to quantify a strategy's exposures.

LOS 26.i

Hedge funds generally bring diversification to traditional stock / bond portfolios, and enhance risk-adjusted returns. The addition of a 20% hedge fund allocation to a traditional 60% stock / 40% bond portfolio generally decreases the portfolio's total standard deviation, increases the Sharpe and Sortino ratios, and decreases maximum drawdown.

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 26.1

1. **C**   Convertible bond arbitrage strategies are generally classified as relative value strategies. (LOS 26.a)

2. **A**   Managed futures strategies are generally classified as opportunistic strategies. (LOS 26.a)

Module Quiz 26.2

1. **A**   EMN strategies usually apply somewhat high levels of leverage in order to produce meaningful levels of return. Neither dedicated short strategies nor short-biased strategies typically make significant use of leverage. (LOS 26.b)

2. **C**   Equity L/S strategies typically have gross exposures of 70%–90% long and 20%–50% short. Dedicated short strategies are usually 60%–120% short at all times. Short-biased strategies are usually around 30%–60% net short. (LOS 26.b)

3. **A**   Compared to various other hedge fund strategies, EMN strategies generally have relatively modest return profiles. EMN funds' primary source of return is alpha. They do not take on beta risk. Their lack of market exposure make EMN strategies attractive in periods of market weakness. (LOS 26.b)

4. **A**   While short positions are possible in distressed securities investing, it is usually long biased. Illiquidity tends to be high, and the strategy generally uses moderate to low leverage. (LOS 26.c)

5. **A**   When a firm's assets are sold off in liquidation, securities holders are paid sequentially depending on the priority of their claims: first senior secured debt, then junior secured debt, unsecured debt, convertible debt, preferred stock, and lastly common stock. (LOS 26.c)

6. **A**   Convertible arbitrage managers generally attempt to extract underpriced implied volatility from holdings of long convertible bonds. To delta and gamma hedge these exposures, the managers will take *short equity* positions. (LOS 26.d)

Module Quiz 26.3

1. **C**   Managed futures strategies usually are implemented via systematic approaches, while global macro strategies more often use discretionary approaches. Both strategies typically use high leverage and tend to be highly liquid. (LOS 26.e)

2. **A**   Returns of managed futures and global macro strategies both typically exhibit right-tail (positive) skewness during times of market stress. Global macro strategies, however, generally deliver more heterogeneous outcomes. (LOS 26.e)

3. **C**   Equity volatility is roughly 80% negatively correlated with equity market returns. Volatility levels rise when equity markets fall. This characteristic makes long volatility strategies useful diversifiers for long equity investments. (LOS 26.f)

4. **C**   In implementing life settlement strategies, a hedge fund manager looks for policies with the following traits: low surrender value being offered to the insured individual, low ongoing premium payments required of the investor, and high probability that the insured person will die sooner than predicted by actuarial methods. (LOS 26.f)

5. **C**   Funds-of-funds generally offer a more diverse strategy mix than do multi-strategy funds. Multi-strategy funds offer *quicker* tactical asset allocation and generally a *better* fee structure (for example, netting risk between strategies is often absorbed by the multi-strategy general partner). (LOS 26.g)

6. **A**   Compared to multi-strategy funds, funds-of-funds offer an investor less transparency. For funds-of-funds, netting risk is higher, and funds-of-funds have more variance due to using comparatively high leverage. (LOS 26.g)

Module Quiz 26.4

1. **C**   This reading uses a model that incorporates four factors: equity risk, credit risk, currency risk, and volatility risk. (The interest rate risk "BOND" and commodity risk "CMDTY" factors used by Hasanhodzic and Lo were dropped due to multicollinearity issues.) (LOS 26.h)

2. **C**   Adding a 20% allocation of a hedge fund strategy to a traditional 60%/40% portfolio usually *decreases* total portfolio standard deviation while it increases Sharpe and Sortino ratios in the combined portfolios. An allocation to hedge funds often *decreases* maximum drawdown. (LOS 26.i)

3. **A**   Adding allocations of equity market-neutral hedge fund strategies to a traditional portfolio has been shown to be effective in generating superior risk-adjusted performance, as evidenced by high Sharpe and Sortino ratios. (The same is true of systematic futures, global macro, and event-driven strategies). On the other hand, fund-of-funds and multi-strategy funds have been found not to enhance risk-adjusted performance significantly. (LOS 26.i)

READING 27: ASSET ALLOCATION TO ALTERNATIVE INVESTMENTS

Study Session 11

EXAM FOCUS

Candidates should understand the potential benefits of adding alternative investments to a portfolio of publicly traded equities and debt, and the factors that enter into the determination of an optimal allocation to alternative investments. Candidates will develop an understanding of the characteristics of different types of alternative investments that affect the asset allocation decision. They should able to contrast factor based optimization with mean-variance optimization. Candidates must pay special attention to liquidity concerns with alternative investments and how an investor's time horizon affects the suitability of specific types of alternative investments.

MODULE 27.1: ROLE OF ALTERNATIVE INVESTMENTS AND DEFINING THE INVESTMENT OPPORTUNITY SET

Video covering
this content is
available online.

LOS 27.a: Explain the roles that alternative investments play in multi-asset portfolios.

CFA® Program Curriculum, Volume 5, page 90

Alternative investments refers to various types of investments including hedge funds, private equity, private credit, commercial real estate, and real assets. There are also different types of investments, with somewhat different characteristics, within each of these categories. Real assets include agricultural commodities, precious metals, industrial metals, agricultural land, and oil. Hedge funds pursue a variety of strategies, including long-short hedging, short bias, risk arbitrage, and various quantitative investment strategies. Private equity funds might specialize in existing healthcare firms or venture capital investments. Each of these will have somewhat different risk and return characteristics as well as different correlations with the returns of traditional investments.

Overall, the goal of adding alternative investments to a portfolio is most often to improve the portfolio's risk and returns profile (e.g., increase the portfolio's **Sharpe ratio**). This can result from investing in assets that increase expected returns, have low risk, or, often, have low returns correlations with other portfolio assets so that diversification across asset classes reduces portfolio risk without sacrificing return. Additionally, investors may seek alternative investments that provide income, the potential for capital growth, or safety (preservation of value).

Private equity and private credit may be viewed primarily as return-enhancing (and risk-increasing) portfolio investments. Real assets may be viewed as risk-reducing (and thus, lower-return) investments. Hedge funds can fall anywhere along this spectrum, depending on the strategies pursued by their managers.

Equity investments, both public and private, typically provide capital growth. Investments in bonds or real estate may generate income. Real assets, and some hedge fund strategies, may diversify risk for an equity portfolio, while private credit may diversify the risk profile for a fixed-income portfolio that is primarily exposed to interest rate risk. Precious metals or government bonds may be seen as safe-haven asset classes.

Hedge funds. Some hedge fund strategies, such as equity long/short or short bias, may somewhat reduce a portfolio's overall equity beta but are mainly expected to increase returns through their managers' security selection skill. Other hedge fund strategies, such as merger arbitrage or global macro, may be less correlated with traditional asset classes.

Private equity. For a portfolio of public equity securities, an allocation to private equity has limited diversification potential because public and private companies face essentially the same risk factors. Thus, the main function of private equity in the portfolio is to increase expected returns.

Private credit. This class of alternative investments include both direct lending and distressed debt. Direct lending is primarily an income-producing investment. For a given range of credit quality, the risk-return profile tends to be similar for direct lending and publicly traded debt, except that direct lending has additional risk (and an expected return premium) due to its illiquidity. Distressed debt has a risk-return profile more like equity securities, because factors specific to the issuer have a greater effect on the debt's performance than factors that affect fixed-income investments in general.

Commercial real estate. Real estate investments can hedge inflation risk. Both rental income and the value of properties owned may increase with inflation.

Real assets. Assets such as commodities, farm and timberland, and infrastructure also protect against inflation risk. Asset holdings can target particular subsets of inflation risk, such as energy, food, or building materials. Infrastructure investments require a longer time horizon and their correlation with inflation may be limited, for example, by utility rate regulations.

LOS 27.b: Compare alternative investments and bonds as risk mitigators in relation to a long equity position.

CFA® Program Curriculum, Volume 5, page 97

Are alternative investments or bonds the better choice for diversifying an equity portfolio? The answer may depend on the investor's investment horizon.

For a short investment horizon, the primary risk facing the investor is returns volatility. Reducing volatility is best achieved by allocating a portion of the portfolio to an asset class with a low correlation of returns with equities.

For alternative investments as an asset class, reported volatility of returns appears lower than the volatility of equity returns, and its correlation with equity returns also appears to be low. However, these statistics are likely to be biased downward for a number of reasons:

- **Appraisal-based** valuations of privately held investments result in smoothing of reported returns.
- Databases of alternative investment returns are subject to sampling biases, such as **survivorship bias** and **backfill bias**, which result in downside risk being understated in the reported data.
- Indexes of alternative investment returns reflect some degree of diversification because funds in an index may have low correlations of returns with each other. Thus, the volatility of returns on the index is less than the average volatility of returns on index components.

As a result, both the volatility of alternative investment returns and their correlation with equity returns may be higher than they appear to be in reported data.

By comparison, bonds as an asset class have had a lower correlation with equity returns than alternative investments. In fact, over the 20 years before 2017, their correlation with equity returns has been negative. (The correlation was positive in the two decades before that, when inflation was higher.) As a result, an allocation to bonds is likely to reduce the volatility of an equity portfolio's returns more than an equal allocation to alternative investments.

With a long time horizon, however, the primary risk is not returns volatility, but failing to achieve a minimum required rate of return over time. For example, an endowment must earn an average rate of return greater than the sum of inflation and its required annual distributions. Because bonds have a lower expected rate of return than equities, allocating assets to bonds may increase the risk of a portfolio failing to earn its needed rate of return.

In this case, alternative investments can be a better choice for diversification. Their returns correlation with equities, while higher than commonly reported, is still less than perfect even after adjusting for statistical biases. Therefore they offer a potential diversification benefit to an equity portfolio. Because the expected return on alternative investments is higher than that of bonds, over a long time horizon they reduce the risk of failing to meet the portfolio's return requirements.

LOS 27.c: Compare traditional and risk-based approaches to defining the investment opportunity set, including alternative investments.

CFA® Program Curriculum, Volume 5, page 102

Traditional approaches to defining the **investment opportunity set** include classifying asset groups by liquidity or by how they perform over economic cycles.

A portfolio manager using a liquidity-based approach would distinguish between alternative investments that are publicly traded, such as futures contracts or REITs, and those that are not publicly traded. Among alternative investments that are not publicly traded, the manager would further classify them by the length of the time commitment required. For example, private equity may be viewed as an asset class that requires a longer-term commitment than private credit, while both require a longer commitment than more liquid alternative investments.

Figure 27.1 shows how asset classes might be considered based on liquidity characteristics.

Figure 27.1: Liquidity-Based Investment Opportunity Set

	Fixed Income	Equity	Other Assets
More Liquid ↓ **Less Liquid**	Cash Bonds Private Credit	Public Equity Equity Hedge Funds Private Equity	Commodity Futures REITs Private Real Estate Private Real Assets
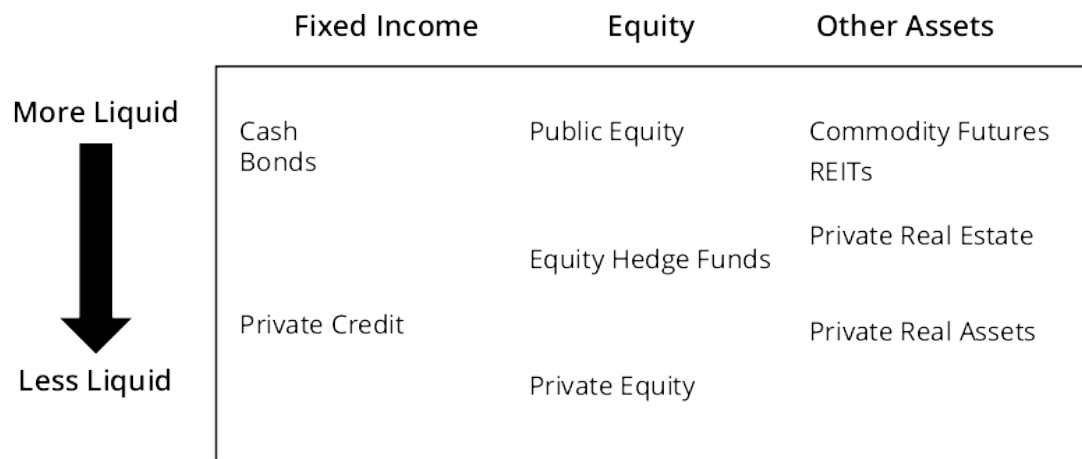
Another traditional approach is to classify assets by how they are expected to perform under different scenarios for economic growth and inflation. Using this approach, a manager would distinguish among asset classes that provide growth in an expanding economy (primarily equities), asset classes that hedge inflation risk (such as real assets and inflation-linked bonds), and asset classes that hedge against deflation (primarily non-inflation-indexed government bonds). Figure 27.2 shows an example of an investment opportunity set that uses this approach.

Figure 27.2: Economic Environment-Based Investment Opportunity Set
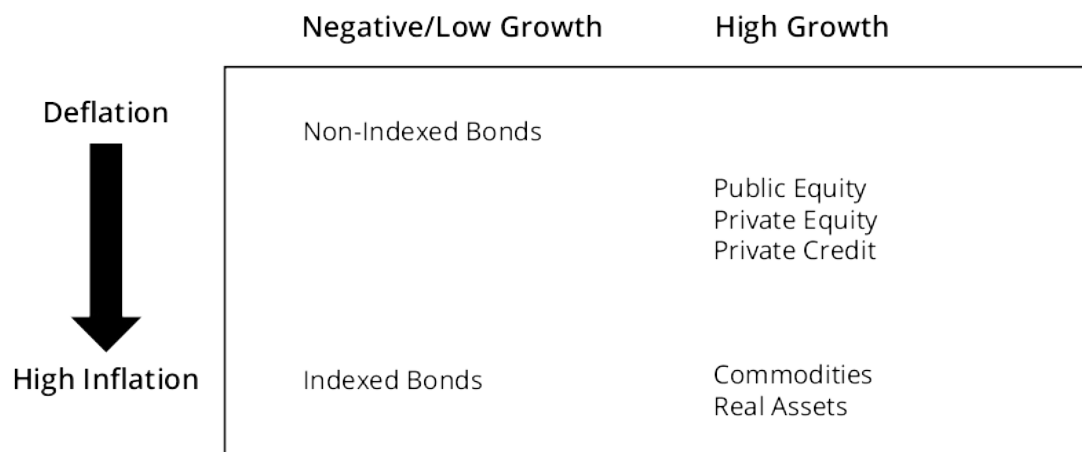
	Negative/Low Growth	High Growth
Deflation ↓ **High Inflation**	Non-Indexed Bonds Indexed Bonds	 Public Equity Private Equity Private Credit Commodities Real Assets

A **risk factor based approach** to defining asset classes involves statistically estimating their sensitivities to risk factors identified by the manager. Examples may include economic growth and inflation, interest rates and credit spreads, or currency values. They may also include factors such as liquidity, capitalization, and value-versus-growth.

With respect to alternative investments, a risk factor analysis may show that some alternative investment classes are similar to traditional asset classes in terms of factor sensitivity. For example, private equity returns are sensitive to many of the same risks as public equity, while private credit has many of the same risk sensitivities as publicly traded high yield bonds.

Identifying sources of risk that are common across asset classes is one of the key advantages of a risk factor based approach. This mitigates a limitation of the traditional approaches, which may classify investments into different classes even when they face largely the same risk factors, leading a manager to believe the portfolio is more diversified than it actually is.

Another advantage of a risk-based approach is that by allowing a manager to analyze multiple dimensions of portfolio risk, this approach is useful for developing an integrated risk management framework. In this sense, it can be more useful than the traditional approaches for highlighting the primary drivers of portfolio risk.

Managers using a risk factor based approach must be aware that risk factor estimates can be sensitive to the period used for analysis. The results may also be more difficult to communicate to decision makers and to implement compared to traditional approaches.

MODULE QUIZ 27.1

To best evaluate your performance, enter your quiz answers online.

1. Which of the following categories of alternative investments would be *most appropriate* for diversifying a portfolio of public equity?
    A. Private equity and short-bias hedge funds.
    B. Long-short hedge funds and distressed debt.
    C. Commercial real estate and global macro hedge funds.

2. For alternative investments as an asset class, appraisal-based valuations and sampling biases are believed to overstate:
    A. returns.
    B. risk measures.
    C. diversification benefits.

MODULE 27.2: CONSIDERATIONS IN ALLOCATING TO ALTERNATIVE INVESTMENTS

Video covering this content is available online.

LOS 27.d: Discuss investment considerations that are important in allocating to different types of alternative investments.

CFA® Program Curriculum, Volume 5, page 111

As with any asset allocation decision, an allocation to alternative investments must consider their risk, expected return, and returns correlation with the existing portfolio. An allocation to alternative investments also requires that investors consider a number of factors specific to this asset class. These include the choice of investment vehicles to be used, liquidity concerns, expenses and fees, the tax status of the investments, and the ability to obtain the expertise needed to invest successfully.

Setting return expectations for alternative investments is made more difficult by their short history relative to other asset classes and by the limited validity of the data that are available. A suggested approach to determining an expected return for a particular class of alternative investments is to estimate each of its risk factor exposures, and add the expected returns from these exposures to the risk-free rate. An analyst may add an assumed return for the fund manager's alpha and subtract fees and taxes, in order to refine this estimate.

Several characteristics of alternative investments limit the usefulness of mean-variance optimization as a tool for determining their appropriate portfolio allocations. Because of illiquidity and valuation issues, option-like return patterns, and the fact that returns from some strategies tend to be low or negative during a drawdown period and high in later years, we cannot assume returns are normally distributed. Additionally, for alternative investments for which committed capital is not immediately invested by the manager, a portfolio's effective allocation to the asset class might be less than its target.

Investment Vehicles

A typical structure for an alternative investment vehicle is a **limited partnership**. The investment manager is the **general partner** and investors in the fund are **limited partners**. With this structure, the liability of investors in the fund is limited to the amount they have committed. Often these limited partnerships are registered offshore for tax or reporting reasons.

Investing directly in a limited partnership is appropriate for large investors that have the expertise to evaluate managers and fund strategies. They typically invest in a variety of limited partnerships to diversify the specific risks that each general partner will take on as they pursue their strategies. Limited partners sometimes co-invest with a general partner, but they cannot be directly involved in fund operations.

For investors that lack the needed expertise, investing through a **fund-of-funds** may be appropriate. A fund-of-funds manager can pool capital from investors and use it to invest in limited partnerships. Typically, a fund-of-funds manager will specialize in a particular subset of alternative investment strategies. The benefit of a fund-of-funds is that it provides access to this asset class to investors who otherwise would not have it. The drawback is that they charge an additional layer of fees above those charged by the underlying limited partnerships.

Some investors that are large enough to demand favorable investment terms may establish **separately managed accounts** (SMAs) through which to access alternative investments. SMAs have requirements for both the investor and the fund manager that can make them challenging to implement. Another approach is to establish a limited partnership with a single client, known as a **fund of one**. A risk with SMAs or funds of one is that general partners, when allocating certain investment opportunities to investors, may favor limited partners who are paying the fund's standard fees.

Some open-ended mutual funds and "**undertakings for collective investment in transferable securities**" (UCITS) have developed to give smaller investors access to alternative investments. However, these structures are more regulated than the other investment vehicles and may constrain managers' choice of strategies. As a result, returns on investments through these structures might not achieve the returns realized by the asset class as a whole.

Liquidity Concerns

Liquidity risk is one of the distinguishing characteristics of alternative investments. Both the investment structures and the underlying investments themselves contribute to liquidity risk.

Limited partnerships for alternative investments are typically structured with subscription provisions for accepting capital, lock-up periods, and restrictions on redemptions. Hedge funds, for example, may accept new capital quarterly or monthly, impose lock-up periods (often six months or a year) during which limited partners may not make redemptions or may do so only with a penalty, and offer redemptions on a quarterly or annual schedule as well as requiring a notice period prior to redemptions. They may also impose "gates" or maximum amounts that can be redeemed at any one time.

For funds in the private equity, private credit, real estate, and real asset sectors, liquidity provisions are often more strict than is typical for hedge funds. Subscriptions are structured in "closes" for new investors, usually over a one-year period. Limited partners commit a stated

amount of capital, and the general partner will "call" this capital over an investment period (such as 3 to 5 years) as they identify investment opportunities. Redemptions are typically not available. Instead, the fund will distribute capital over its life (often 10 to 12 years) as it exits its investments. A small secondary market exists for limited partnerships, but transactions often take place at significant discounts to funds' net asset values and may require approval from the general partner.

Figure 27.3 illustrates a time line of cash flows that might occur for a $10 million commitment to a private equity fund.

Figure 27.3: $10 Million Capital Commitment to a Hypothetical Private Equity Fund
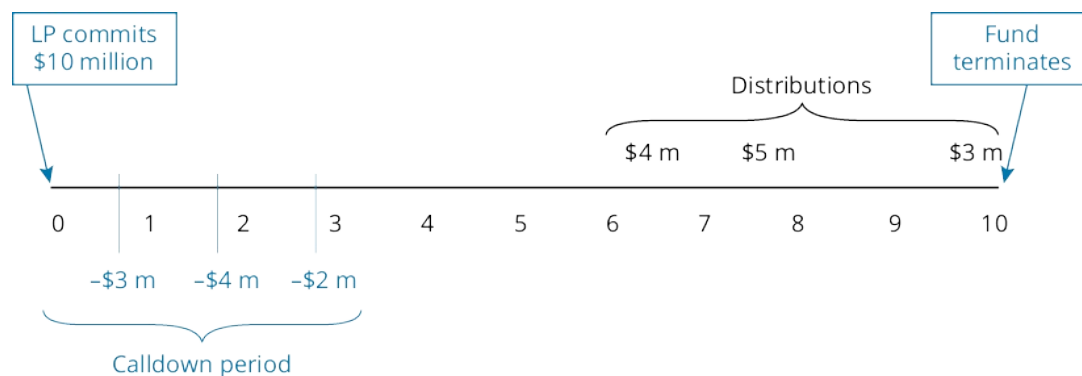
Note in the figure that only $9 million of the limited partner's capital was called. A general partner is not required to call the full amount of committed capital. This is an important consideration when estimating expected returns on a portfolio allocation to alternative investments. A fund may achieve an impressive rate of return, but a limited partner is only earning that return on the portion of committed capital that has been called.

Neither **capital calls** nor distributions occur on a predetermined schedule. Capital may be called (or not) at any time during the **calldown period**. Distributions can occur at any point in the fund's life, even during the calldown period. This, too, affects how much of a portfolio's allocation to alternative investments is actually invested at any point in time.

Limited partners must also consider the opportunity cost of their committed capital during the calldown period. Investing this capital in cash equivalents reduces returns. On the other hand, investing it in higher return but less liquid investments risks missing a capital call. Penalties for doing so can be severe, such as forfeiting all capital invested in the fund to date.

With respect to the liquidity of a fund's holdings, a potential issue is whether they are consistent with the fund's redemption terms. This is mostly a consideration for hedge funds; as noted previously, other types of private investment funds generally do not offer redemptions.

Hedge funds that pursue long-only equity strategies tend to hold relatively liquid investments that are consistent with offering redemptions monthly or quarterly. Short positions are less liquid, which can be a concern if funds that hold significant short positions also offer redemptions frequently. Investors should also note that general partners might designate some of a fund's less liquid holdings as not subject to the fund's ordinary redemption terms. This is referred to as a "**side pocket**." A fund's redemption terms may be misleading if a large portion of its holdings are side pocketed.

Frequent redemption periods may limit a general partner's flexibility to implement strategies with long time horizons or infrequent investment opportunities, such as event-driven strategies. This is particularly true for distressed assets and is the reason funds specializing in those tend to be private equity partnerships rather than hedge funds.

Funds that hold significant portions of illiquid investments, such as some relative value funds, may restrict redemptions under certain market conditions to avoid having to liquidate these assets during crisis periods. One effect of these restrictions is that during such periods, investors may demand redemptions from other hedge funds that have more liquid holdings.

Leverage is another important liquidity consideration because creditors have priority of claims over limited partners. Margin calls may force a leveraged fund to sell its most liquid holdings and be left with its less liquid investments, regardless of which holdings the general partner would otherwise prefer to keep.

Expenses, Fees, and Taxes

Many alternative investments involve significant fees and expenses, such as the "2 and 20" fee structure of many hedge funds (annual management fee 2% of assets under management, incentive fee 20% of gains). Administrative expenses of a fund may also be passed through to investors.

Funds with calldown structures charge management fees on the amount of committed capital, regardless of how much of it has been called down. This may generate negative returns in the early years of an investment when much of the committed capital is yet to be called.

Investors must ensure that their investments, and the investment vehicles used to invest, are consistent with their tax situations. Some fund strategies may result in short-term taxable income to investors, or may be subject to tax withholding. Investors who need to estimate their annual income for tax reporting may find it difficult to do so given the unpredictable nature of returns from many alternative investments. Tax-exempt organizations must ensure that income from a fund will not be considered to be unrelated to the organization's purpose, and therefore considered taxable.

Intermediaries or In-House Programs

Large investors may consider developing their own program for implementing alternative investments directly rather than using intermediaries such as funds of funds. An in-house program may be appropriate for an investor that needs highly customized solutions, desires close control over its investment program, or wishes to implement co-investments with general partners. The "build or buy" decision depends on whether the investor can produce similar results to those of an intermediary at lower cost or generate returns high enough to offset any costs in excess of the costs charged by an intermediary.

A successful program must be able to identify and invest with the best fund managers. Even if an investor is expert at choosing managers who will generate top returns, those managers may attract more capital than they can invest productively, and therefore close their funds to new investors. Managers may also decline capital from investors whose public reporting requirements they feel would be inconsistent with their proprietary strategies.

Investors must also be able to perform due diligence on managers with whom they wish to invest. This requires access to their key decision makers, both before and during the life of an

investment. Without this level of access, an investor may be left in a troubled fund when better-informed investors have already demanded redemptions.

MODULE QUIZ 27.2

To best evaluate your performance, enter your quiz answers online.

1. A limited partnership structure with a single client is known as:
   A. UCITS.
   B. a fund of one.
   C. a separately managed account.

2. Cash flows from investors into a private equity limited partnership:
   A. are at the discretion of the general partner.
   B. will be 100% invested after three to five years.
   C. are made only on the establishment date of the partnership.

3. Which of the following terms describes the practice of a hedge fund designating certain of its investment holdings as exempt from the fund's ordinary redemption terms?
   A. Gate.
   B. Lock-up.
   C. Side pocket.

MODULE 27.3: SUITABILITY, APPROACHES, LIQUIDITY, AND MONITORING IN ALLOCATING TO ALTERNATIVE INVESTMENTS

Video covering this content is available online.

LOS 27.e: Discuss suitability considerations in allocating to alternative investments.

CFA® Program Curriculum, Volume 5, page 121

In general, alternative investments are only suitable for large investors who have or can hire the specialized knowledge necessary to select profitable investments in this asset class. Because of the wide variety and complexity of alternative investment strategies that managers pursue, an investor needs a high level of expertise to understand the risks being undertaken and the market factors that drive the success of various fund strategies.

Alternative investment strategies are largely based on the premise that skilled managers can create value through active management. For this reason, alternative investments may not be suitable for investors whose philosophy is grounded in a belief in the price-efficiency of markets.

Time (investment) horizon is a key consideration in determining the suitability of alternative investments. Private equity and private real assets are generally suitable only for investors with long time horizons (15 years or more). For investors with shorter time horizons, hedge funds with short lock-up periods and strategies that can be exited relatively quickly may be suitable. Hedge funds that focus on liquid instruments such as publicly traded equities or commodity futures are examples.

A successful alternative investments program requires that the investor has a strong governance program. The investor should have a formal investment policy with clear objectives, put decision-making power in the hands of experts, and have a reliable reporting framework.

Investors in alternative investments must be comfortable with a lower level of transparency than is generally available with traditional investments. As private partnerships, the funds are

not governed by the reporting requirements that apply to publicly traded companies. When they do issue reports to investors, the level of detail varies widely and reports often arrive with a significant time lag. Many hedge funds use independent administrators to calculate their net asset values, but private equity and private real asset funds typically do not, which gives them wider discretion in asset valuation. Furthermore, private equity and private real assets may be viewed as "blind pools" in that a fund does not begin acquiring assets until investors have already committed capital to the fund.

LOS 27.f: Discuss approaches to asset allocation to alternative investments.

CFA® Program Curriculum, Volume 5, page 125

A suggested approach to including alternative investments in an asset allocation decision is to do it in two stages, first with only the traditional asset classes and then also considering alternative investments. The process can be assisted by statistical tools such as:

- Monte Carlo simulation.
- Mean-variance optimization.
- Risk factor based optimization.

These approaches can be used individually or in combination. Regardless of the approach chosen, an investor must consider the statistical properties of alternative investment returns that distinguish them from traditional asset classes.

Modeling the risk and return properties of alternative investments is challenging. Because asset valuations for many alternative investments are based on appraisals, returns data are likely to be artificially smoothed and are often stale. As a result, using these data without adjustment would underestimate risk. Testing returns data for serial correlation is a suggested method for detecting this smoothing effect. If serial correlation is present, statistical techniques exist that can be used to unsmooth the data.

The distribution of returns is also known to be non-normal, exhibiting skew and excess kurtosis to a greater extent than traditional asset classes. Here, too, the data can be adjusted with statistical methods (such as stochastic volatility, regime switching, or extreme value theory) or by using observed returns instead of an assumed normal distribution of returns. A further limitation is the relatively short history of alternative investments, which may result in small-sample and time-period biases.

One method for modeling a distribution with fat tails (positive excess kurtosis) is to define risk and return properties for two or more distinct market environments, for example, a normal period and a high-volatility period. Returns for each of these can be described with a normal distribution with its own assumed mean and variance. Combining the distributions, using an assumed probability of each environment occurring, results in a non-normal distribution.

Monte Carlo simulation has been described elsewhere in the CFA curriculum. Its use with respect to optimizing an asset allocation can be summarized as follows:

1. Decide between asset class returns or risk factors as the variables to be simulated.
2. Define how the model should behave statistically, for example by accounting for properties like mean reversion, fat-tailed distributions, or unstable correlations.
3. If the model is based on risk factors, translate them to asset class returns.

4. Use the resulting asset class return scenarios to develop meaningful outputs, such as the probability of a shortfall to a portfolio's required or target rate of return.

We introduced **mean-variance optimization** in an earlier topic review and described its use with traditional asset classes. When using this technique with alternative investments, the results may produce an excessive allocation to this asset class, particularly to illiquid investments such as private equity, especially when the data are not properly adjusted for smoothed returns. An optimization model may be designed to constrain the allocation to alternative investments (or any asset class) to be within a minimum and maximum percentage, or to limit overall volatility or downside risk.

Investors should consider the asset allocations suggested by an optimization model to be a guideline rather than a prescription. They must consider the allocation in the context of their objectives and constraints, such as their liquidity requirements. They must also be aware of the limitations of mean-variance optimization. For example, small changes in the inputs may generate significant changes in optimal asset allocations.

Risk factor based optimization is similar to MVO, but instead of modeling asset classes by their return and risk characteristics, the investor models risk factors and factor return expectations. Exposures to risk factors are optimized with respect to an overall risk budget. As with mean-variance optimization, constraints can be included in the model. In this case, the constraints are limits on specific risk factor exposures.

A risk factor based approach requires the additional step of translating the optimized risk exposures to an asset allocation to achieve them. For example, both public and private equity provide exposure to economic growth risk, but the allocation to each depends on the desired exposure to liquidity risk.

One of the limitations of this approach is that asset classes' return sensitivity to some risk factor exposures might not be stable over time. Another is that correlations among risk factors may behave like correlations among asset class returns and increase during periods of financial stress.

> **PROFESSOR'S NOTE**
>
> The curriculum reading provides extended examples of these portfolio optimization techniques. While we do not believe the authors' empirical results are required by the Level III LOS, reviewing these examples can provide useful insights into how the techniques may be applied to asset allocation in practice.

LOS 27.g: Discuss the importance of liquidity planning in allocating to alternative investments.

CFA® Program Curriculum, Volume 5, page 147

Managing liquidity is a crucial aspect of an alternative investments program, especially one that includes private investments with near-term capital calldown periods and long investment horizons. A portfolio must be managed in a way that meets its capital commitments while still providing required liquidity.

An investor can develop forecasting models to help manage liquidity. Examples of liquidity modeling include projecting cash flows to and from a fund and forecasting the annual capital commitments needed to reach and maintain the targeted allocation to alternative investments.

Cash flows for a typical private investment partnership are capital calls in the early years and distributions in the later years. An investor can make assumptions about how a fund will call its committed capital. A simple model might assign a percentage of remaining capital to each year of the calldown period. In this model the capital contribution in period t would be the following:

percentage to be called in period t × (committed capital – capital previously called)

Distributions from a fund can be modeled as percentages of its net asset value. The NAV increases with capital calls and investment returns, and decreases with distributions. To estimate distributions, an investor can assume an expected growth rate for the fund (that is, the IRR of its investments) and a percentage of NAV to be distributed in each period. Thus distributions in period t would be the following:

percentage to be distributed in period t × [NAV in period $t – 1$ × (1 + growth rate)]

and the NAV in period t would be the following:

NAV in period $t – 1$ × (1 + growth rate)
+ contributions in period t
– distributions in period t

Using models such as these, an investor can estimate the cash flows to and from a fund. The investor should understand a model's sensitivity to changes in model assumptions and how these affect cash flow forecasts.

Liquidity forecasting is also important for managing how a portfolio reaches and maintains its target asset allocations. Take for example a $15 billion portfolio that currently has no investments in private equity but wants to have a 10% allocation to that asset class. This is unlikely to be achievable all at once (and even if it could be, the private equity investments would not be diversified across vintage years as they should).

Instead, the allocation to private equity will need to increase toward its 10% target over a number of years. Importantly, that percentage will be based on the future values of both the overall portfolio and the private equity investments. Thus, reaching and maintaining the target allocation requires estimating these values.

Combined with the cash flow forecasting approach described previously for a particular fund, an investor can project the capital commitments needed over a span of years to reach the target allocation, and forecast the need to reinvest future distributions to maintain the target.

A crucial aspect of liquidity planning is having cash available to meet capital calls. Keeping these amounts in cash equivalents has significant opportunity costs. A suggested approach is to invest it in publicly traded securities that may be viewed as proxies for the private investments to which they are committed. For example, capital committed to private real estate but not yet called could be invested in publicly traded real estate investment trusts.

Capital calls, distributions, growth rates, and even fund lifetimes may turn out significantly different than expected. An investor should stress-test liquidity planning models against unexpected events such as delayed fund distributions when expected distributions have been earmarked to meet capital calls.

LOS 27.h: Discuss considerations in monitoring alternative investment programs.

An alternative investment program must be monitored to ensure that it is achieving its stated goals in terms of return, risk, income, and safety. Its performance should be evaluated in the context of these goals, rather than simply measured against a benchmark.

Even during the period when the allocation to alternative investments is building up to its target, monitoring is necessary to ensure the investments being made are consistent with the objectives of the program. Effective monitoring is particularly important with private and illiquid investments, because these require considerable time to correct if they are out of line with the portfolio's objectives, or if the objectives have changed.

One reason that measuring against a benchmark or peer group can be misleading is the difficulty of selecting a representative one. Because many alternative investment strategies depend heavily on active management, any benchmark chosen is unlikely to be directly comparable to a portfolio's actual investments in the asset class. In addition, published indexes are often inconsistent with each other in the way they define various alternative investment strategies.

Monitoring of alternative investments can be challenging because their performance reporting can be infrequent and come with significant time lags. A further complication with private investments is that they often report internal rates of return rather than time-weighted rates of return. IRR is influenced by the timing of capital calls and distributions, and therefore, may be subject to manipulation. Investors may prefer to monitor a private fund's **multiple on invested capital** (MOIC). MOIC is calculated by dividing the value of the fund's underlying investments, minus distributions, by total invested capital. Regardless of the metric used, investors should understand how any measure is affected by issues such as stale pricing and appraisal-based valuations. Understanding a fund's investment holdings qualitatively may be the best approach to judging whether a manager is adding value.

An investor should monitor these issues with respect to an alternative investment fund's management:

- A fund's "key persons" are typically specified in its documents. Limited partners may be able to exercise certain rights if a key person leaves, and should understand the circumstances that caused the departure.

- The manager's interests should be aligned with the investor's interests. Potential conflicts may exist if the manager raises a new fund that invests in some of the same underlying holdings. If a manager withdraws capital that he had invested alongside the limited partners, they should learn the reasons.

- Because managers have a great deal of discretion over how they invest capital, investors should monitor a fund's holdings over time for signs of style drift.

- Monitoring a fund's risk management framework is important, especially for leveraged strategies.

- An investor should observe the profile of a fund's other investors and judge whether they are likely to remain committed for the long term. An unexpected increase in redemptions by other investors may be a warning sign. This could potentially put the fund in a position of having to sell its more attractive holdings to raise cash, leaving the remaining investors with less liquid or more poorly performing assets. A manager may also exercise "gates" that block further redemptions.

- A large or unexpected increase in new investors may make more capital available to a manager than he has attractive opportunities to use. If this leads the manager to pursue lesser opportunities, the performance of the fund as a whole may suffer.
- A fund should have reliable auditors, custodians, and other third-party service providers. If these relationships change, an investor should understand whether it is for a positive reason (e.g., the fund outgrows the capabilities of a service provider and needs a larger one) or otherwise (e.g., an auditor quits a relationship because of a manager's actions).

MODULE QUIZ 27.3

To best evaluate your performance, enter your quiz answers online.

1. Which class of publicly traded securities is *most likely* to be affected by similar risk factors to those that affect private credit?
    - A. REITs.
    - B. Equity securities.
    - C. High yield bonds.

2. Alternative investments are *most likely* to be suitable for a portfolio investor that:
    - A. has a strong governance program and insists on transparency.
    - B. has a long time horizon and believes financial markets are efficient.
    - C. believes active management can generate excess risk-adjusted returns over time.

3. When using optimization approaches to determine an allocation to alternative investments, recommended practices *least likely* include:
    - A. using only unsmoothed historical data as inputs.
    - B. modeling normal and high-volatility periods separately.
    - C. placing constraints on the allocations to various asset classes.

4. A $20 billion endowment has decided to increase its allocations to private equity and private credit from 5% each to 10% each. The endowment will *most likely* need to:
    - A. forecast the timing of capital calls and hold enough capital in cash equivalents to meet them.
    - B. account for the expected growth rate of the portfolio when planning the capital commitment.
    - C. identify suitable investment vehicles for $100 million each of private equity and private credit.

5. Compared to an alternative investment partnership's reported internal rate of return, its multiple on invested capital is less affected by:
    - A. stale pricing.
    - B. timing of capital calls.
    - C. appraisal-based valuations.

LOS 27.a

Allocating portfolio assets to alternative investments can improve the risk-adjusted return of a portfolio that includes only traditional asset classes. Private equity and private credit may be viewed primarily as return-enhancing portfolio investments. Real assets may be viewed as risk-reducing investments. Hedge funds may serve either function in a portfolio, depending on the strategies they pursue.

LOS 27.b

Whether bonds or alternative investments are better risk mitigators for an equity portfolio depends on the investor's time horizon. Over short horizons, return volatility is the predominant risk, and bond returns have a lower correlation with equity returns than do alternative investment returns. Over long horizons, the main risk is failing to achieve the target return, so alternative investments may be more suitable than bonds because of their higher expected returns.

LOS 27.c

Traditional approaches to defining the investment opportunity set may be based on asset classes' liquidity or expected performance in different scenarios for economic growth and inflation.

A liquidity-based approach would distinguish among alternative investment classes that are publicly traded, such as REITs and commodity futures, and those that are not publicly traded, such as private equity.

An approach based on expected performance would distinguish alternative investment classes that are expected to outperform in a high-growth economy, such as private equity, from those that would be expected to provide an inflation hedge, such as indexed bonds or real assets.

A risk factor based approach to defining asset classes involves statistically estimating their sensitivities to risk factors. Its advantages compared to traditional approaches are that it can identify sources of risk that are common to different asset classes (such as public and private equity) and allow a manager to analyze multiple dimensions of portfolio risk. Its limitations are that it can be difficult to communicate to decision makers and implement, and that its results may be sensitive to the historical period used in the analysis.

LOS 27.d

In addition to risk, return, and correlation, important considerations for alternative investments include investment vehicles, liquidity, expenses and fees, taxes, and the need to obtain special understanding of the asset class.

Alternative investment funds are typically structured as limited partnerships, with the manager as general partner and investors as limited partners. Investors that are not large enough to invest directly in limited partnerships often invest in funds of funds to gain exposure to alternative investments.

Liquidity concerns include lock-up periods, redemption restrictions, the opportunity cost of committed capital, and the practice of "side pocketing" to exempt some assets from a hedge fund's redemption terms.

Alternative investment funds charge management fees and incentive fees. Management fees are based on committed capital rather than called capital. Investors must ensure that a fund's activities and distributions are consistent with their tax situations.

When deciding whether to invest through funds of funds or develop an in-house program, investors should consider the expense of developing and maintaining a program, their needs for customized solutions and close control, and whether they intend to make co-investments with general partners.

LOS 27.e

Alternative investments are suitable for large investors with long time horizons, the specialized knowledge to succeed in this asset class, strong governance frameworks, comfort with a lack of transparency, and a belief that active management can create value.

LOS 27.f

Asset allocation approaches such as Monte Carlo simulation, mean-variance optimization, and risk factor based optimization can be extended to include alternative investments. However, investors must take care to adjust the data for this asset class for smoothed returns that underestimate risk, and to include constraints in their asset allocation models. Otherwise these techniques are likely to over-allocate to alternative investments.

LOS 27.g

Liquidity planning for alternative investments must be managed such that the investor meets its capital commitments. An investor can develop forecasting models to project cash flows to and from a fund and forecast the capital commitments needed to reach and maintain the targeted allocation to alternative investments. These models should be tested for sensitivity to their assumptions about the timing of capital calls, distributions, growth rates, and lifetimes of the funds.

LOS 27.h

An alternative investment program must be monitored to ensure that it is achieving its stated goals. Its performance should be evaluated in the context of these goals, rather than measured against a benchmark. An appropriate benchmark is difficult to establish for an alternative investments program because its performance depends greatly on active management by the managers chosen.

Investors in private funds may choose *multiple on invested capital* as a metric to monitor, rather than the internal rates of return reported by the funds.

Investors should monitor an alternative investment fund's key persons, risk management framework, and third-party service providers, as well as the profile of the fund's other investors. They should be alert for signs of style drift or misalignment of a manager's interests with investors' interests.

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 27.1

1. **C** Alternative investments that can diversify a public equity portfolio include commercial real estate, real assets, and hedge funds that pursue non-equity-oriented strategies. Private equity, distressed debt, and equity-oriented hedge funds are less appropriate because they are affected by many of the same risk factors as public equity. (LOS 27.a)

2. **C** Smoothing of returns and sampling biases are believed to understate the correlation of alternative investments with traditional asset classes and therefore overstate their diversification benefits. These data issues are believed to understate risk measures. Their effect on reported returns is not clear. (LOS 27.b)

Module Quiz 27.2

1. **B** A fund of one is a limited partnership structure that has only a single client. (LOS 27.d)

2. **A** Typically, in private equity limited partnerships, the limited partners commit a fixed amount of capital, which the general partner can call over a number of years as investment opportunities arise. Limited partners are responsible for having cash available to meet capital calls. General partners may call less than 100% of the committed capital. (LOS 27.d)

3. **C** Assets that are not subject to a fund's redemption terms are said to be held in a side pocket. A gate is a maximum amount an investor may redeem at one time. A lock-up is a restriction on redemptions during a period of time. (LOS 27.d)

Module Quiz 27.3

1. **C** High yield debt may be viewed as a proxy for private debt because they tend to be affected by the same risk factors. (LOS 27.c, 27.g)

2. **C** Allocating to alternative investments is most suitable for investors with long time horizons, strong governance programs, comfort with limited transparency, and a belief that active managers add value. (LOS 27.e)

3. **A** Because some alternative investments have relatively short histories of returns data, use of historical data alone may introduce time-period and small-sample biases. Unsmoothing is recommended because the data often reflect appraisal-based valuations. (LOS 27.f)

4. **B** To achieve a target allocation to alternative investments, an investor needs to account for the expected growth rate of the portfolio. Because the target will likely only be reached a number of years in the future, the commitment to the asset class will be larger than the target allocation as a percentage of today's portfolio value. Immediately investing the targeted percentage, even if enough suitable investments can be found, would lack diversification across vintage years. To reduce the opportunity cost of

committed capital, cash that needs to be available if called can be invested in liquid public securities that have similar risk characteristics as their intended private investments. (LOS 27.g)

5. **B** Multiple on invested capital is less subject to manipulation of cash flow timing by a manager than IRR, but may sill reflect stale pricing and appraisal-based valuations. (LOS 27.h)

TOPIC ASSESSMENT: ALTERNATIVE INVESTMENTS

Use the following information for Questions 1 through 6.

Suzanne Harlan has a large, well-diversified stock and bond portfolio. She wants to try some alternative investments and has contracted with Laurence Philips, principal of Philips Finance, to help assemble a new portfolio.

Before agreeing to make recommendations for Harlan, Philips wants to determine whether she is a good candidate for alternative investments. He gives her a standard questionnaire that asks open-ended questions of all potential clients. Here are some of Harlan's comments:

- "I'm interested in higher returns. I'm not afraid of risk, and I'm investing this money for the benefit of my eventual heirs."
- "I pay several million dollars in taxes every year, and I want any additional investments to be consistent with my tax situation."
- "While I expect risk on an individual-investment basis, I'd like to further diversify my portfolio and reduce overall risk."
- "I pay a lot of attention to expense and return data from my investments and track their performance closely."
- "I'm 65 years old and in excellent health."

After reading Harlan's responses and learning that she is a fairly sophisticated investor, Philips agrees to take her on as a client. Harlan has a lot of experience with investments and has some ideas for where she'd like to invest. She brings Philips the following ideas:

- "I have a colleague in the timber business who says the furniture market is booming, and demand should increase in the year ahead. I'm interested in increasing my exposure to real assets, but I'm unsure how they will impact the risk profile of my overall portfolio."
- "Hedge funds are earning excellent returns, and I expect them to continue doing so. However, other investors have told me that the difficulty lies in assessing the quality of the funds, because they are not well regulated. So I'm interested in purchasing a fund-of-funds, so I can diversify my risk while potentially sharing in some outsized returns."
- "I already own public equity securities, but I'm also interested in private equity securities. I've been informed that both public and private companies face similar risk factors."
- "My neighbors founded Kelly Tool and Equipment, a machine-tool business, 20 years ago. I have contacts in the manufacturing business overseas who would be interested in acquiring Kelly's assets. My Asian colleagues are willing to pay about 60% of book value for the assets, and my neighbors are willing to sell me the company for about 50% of the book value of its assets."

Harlan then tells Philips that it is imperative that the returns of any investments he recommends be in some way comparable to a benchmark.

Philips is not excited about the commodity idea and does not like funds-of-funds. However, he does know several managers of individual hedge funds that might interest Harlan. He talks

her out of the fund-of-funds idea and suggests she put her money into the Stillman Fund, which is run by one of his college friends. Fund manager Mark Stillman concentrates on spin-offs, generally buying the spun-off company and shorting the parent company.

1. Which pair of Harlan's proposed investments represent the *best* choice for Harlan's goal of increasing return and of diversification in her portfolio? Consider each goal separately.

Net Returns	Diversification
A. Private equity	Hedge funds
B. Real assets	Hedge funds
C. Private equity	Kelly Tool and Equipment

2. Based on her investment suggestions and survey answers, Harlan is *least* concerned with:
   A. inflation.
   B. liquidity.
   C. volatility.

3. In his attempt to talk Harlan out of investing in a fund-of-funds, Philips addressed the advantages of investing in individual funds. Which of the following is his *most* compelling argument?
   A. The lower expenses of individual funds.
   B. The lack of diversification for a fund-of-funds.
   C. The lack of due diligence for a fund-of-funds.

4. The Stillman fund uses which strategy?
   A. Long/short equity.
   B. Relative value.
   C. Merger arbitrage.

5. Which of Harlan's responses is *most likely* to make Philips consider her a bad candidate for alternative investments?
   A. "I'm interested in higher returns. I'm not afraid of risk, and I'm investing this money for the benefit of my eventual heirs."
   B. "I pay several million dollars in taxes every year, and I want any additional investments to be consistent with my tax situation."
   C. "I pay a lot of attention to expense and return data from my investments and track their performance closely."

6. How should Philips respond to Harlan regarding her statement about benchmarks?
   A. The performance of alternative investment strategy can be easily evaluated against a benchmark.
   B. Alternative investment strategies are consistently defined across published indices.
   C. An appropriate benchmark is difficult to establish for an alternative investments strategy.

TOPIC ASSESSMENT ANSWERS: ALTERNATIVE INVESTMENTS

1. **A**   Private equity and private credit may be viewed primarily as return-enhancing (and risk-increasing) portfolio investments. Real assets may be viewed as risk-reducing (and thus, lower-return) investments.

   The use of a fund-of-funds would provide diversified exposure to hedge funds and some portfolio diversification. In contrast, Kelly Tool and Equipment has high security specific risk and is less likely to provide diversification. Given Harlan's view that it is undervalued it could also be a return enhancer, but it was not offered as a choice for that goal. (Study Session 11, Module 27.1, LOS 27.a)

2. **B**   While Harlan's comment about being willing to accept risk may suggest she is not concerned about volatility, she is most definitely concerned on a portfolio level, as evidenced by her desire to use alternative assets for diversification purposes. Nothing in the information presented offers any hint about Harlan's concerns about inflation. However, Harlan's stated desire to build wealth for her heirs suggests liquidity is not a concern. (Study Session 11, Module 27.2, LOS 27.d)

3. **A**   The biggest disadvantage of the fund-of-funds is the extra layer of fees. Funds-of-funds provide a number of benefits including diversification across hedge fund strategies and due diligence. (Study Session 11, Module 26.1, LOS 26.g)

4. **C**   Merger arbitrage funds usually focus on mergers, spin-offs, or takeovers, buying one company in the transaction and shorting the other. (Study Session 11, Module 26.1, LOS 26.c)

5. **C**   Alternative assets can provide high returns, and a high risk tolerance and low need for liquidity are positives for investors in alternative asset classes. And while many alternative assets are risky, they can provide a substantial diversification benefit when combined with mainstream investments. Investors must ensure that an alternative investment fund's activities and distributions are consistent with their tax situations. However, monitoring of alternative investments can be challenging because their performance reporting can be infrequent and come with significant time lags. (Study Session 11, Module 27.3, LOS 27.h)

6. **C**   An appropriate benchmark is difficult to establish for an alternative investments program because its performance depends greatly on active management by the managers chosen. The performance of an alternative investment program should be evaluated in the context of stated goals, rather than measured against a benchmark. Also, published indices are often inconsistent with each other in the way they define various alternative investment strategies. (Study Session 11, Module 27.3, LOS 27.h)

READING 28: OVERVIEW OF PRIVATE WEALTH MANAGEMENT

EXAM FOCUS

The morning exam has traditionally been heavily weighted toward investment policy statement (IPS) questions for individuals and institutions.

To answer IPS questions successfully, you must:

1. Be familiar with and understand a large number of potential issues that might apply in a given situation. These are covered in the SchweserNotes and CFA readings. There is no substitute for reading the material.

2. Carefully read and understand the facts of the case to determine which issues from Item 1 are relevant. Because each case is unique, you cannot expect to pass just by repeating what you saw as the answer to a previous question. CFA Institute says that the Level III exam is unique in requiring a high level of judgment—it is these questions where that most comes into play. You will have the opportunity to practice this as you go forward in the Schweser material.

3. Recognize that there is a process at work in developing an IPS and constructing a portfolio for a client. As the exam has required candidates to construct an IPS and then use it, we focus on this in our material.

4. The last stage is to construct a written answer that reflects Items 1, 2, and 3. This has not been required on other levels of the exam. The morning session is generally referred to as essay; however, the more precise term is constructed response. The key points that should appear in your answer have been decided, and your answer is evaluated strictly in terms of how well it makes and supports those points in a coherent fashion. Practice writing an effective constructed response answer many times before the exam.

5. A significant percentage of Level III candidates find this section frustrating because it does not meet their personal sense of consistency. Past answers are quite consistent on the main important issues, but they also include a range of random unimportant comments. The random comments are frustrating to candidates who try to repeat what they have seen in past answers. Try to move past that and learn what is expected. Up until now, the CFA exam process has primarily focused on precise mathematical techniques. The Level III material will continue to draw on those skills. However, this exam will likely test your ability to find what another trained professional would have been expected to find and write when confronted with sometimes contradictory issues.

The next pages will lay out a variety of issues with which you are expected to be familiar. They may or may not be relevant to a given portfolio question. The exam will likely test the ability to determine what is relevant to a particular case and then apply it.

MODULE 28.1: INVESTMENT CONCERNS OF PRIVATE CLIENTS AND INSTITUTIONS

LOS 28.a: Contrast private client and institutional client investment concerns.

CFA® Program Curriculum, Volume 5, page 174

Private clients, such as individuals and families, have different investment concerns from institutional investors, such as pension funds, endowments, banks, and insurance companies. These investment concerns include investment objectives and constraints as well as other considerations, such as governance structure, investment sophistication, regulatory environment, and investor uniqueness and complexity.

Investment Objectives

Private clients have a *wide range of investment objectives*, such as maintaining the real value of the investment portfolio, being financially secure in retirement, and providing financial support to family members. However, *these objectives may not be precisely defined*, as the private client may not be able to quantify the size of the investment portfolio required at the start of retirement or the annual cash flows required to fund the college expenses of dependents. The investment objectives of a private client *can change over time* due to life events and/or the performance of the client's investment portfolio. In addition, certain investment objectives *may be difficult to reconcile*, such as financial security in retirement and the ability to generously fund charitable projects at the same time.

Institutional clients, on the other hand, are more likely to have *clearly defined objectives* that are usually focused on funding liabilities (e.g., defined benefit pension plans and insurance companies). The investment objectives of institutional clients also tend to remain *stable over time*.

Constraints

Private clients have different constraints from institutional clients with respect to the following:

- **Time horizon.** Private clients have *shorter* time horizons compared to institutional clients, whose time horizons can theoretically be infinite. The shorter time horizons limit the liquidity and risk-taking ability of private clients. A private client may also specify *different time horizons* for different investment objectives. In contrast, institutional clients typically have a single time horizon for a clearly defined objective.

- **Scale (or size).** Private client portfolios are usually *smaller* compared to those of institutional clients. As a result, certain asset classes, such as real estate and hedge funds, may be deemed unsuitable for private client portfolios as these investments may lead to an overly concentrated portfolio.

- *Taxes.* Taxes are an important consideration for private clients and can impact asset allocation and manager selection. In contrast, some institutional clients, such as endowments and foundations, may benefit from significant tax exemptions.

Other Considerations

Apart from investment objectives and constraints, the following investment concerns impact private clients and institutional investors in different ways:

- *Governance structure.* Institutional clients are likely to have a *formal investment governance structure,* with a board of directors and investment committee responsible for overseeing investment strategy and monitoring performance. On the other hand, private clients tend to have less formal investment governance, with a private wealth manager responsible for formulating the IPS, implementing the investment strategy, and reporting performance.

- *Investment sophistication.* Due to their formal governance structure and greater access to investment resources, institutional investors tend to be *more sophisticated* than private clients. Private clients are also more likely to display *emotional biases* in their investment decision-making, which may cause them to make suboptimal decisions.

- *Regulatory environment.* The regulatory environment for private clients and institutional investors varies greatly by jurisdiction. Some countries, like Australia and India, have the same regulator for these two investor groups, whereas other countries, like the United States, employ different regulators for each investor group.

- *Investor uniqueness and complexity.* Due to their uniqueness and complexity, individuals with similar investment objectives may choose very different investment strategies because of their different concerns and backgrounds. This is less likely to be observed with institutional investors.

MODULE QUIZ 28.1

To best evaluate your performance, enter your quiz answers online.

1. Which of the following statements is *most accurate* with respect to the difference between private and institutional clients?
    A. Private clients are more likely to have clearly defined investment objectives compared to institutional clients.
    B. Private clients are likely to have shorter investment horizons and smaller portfolio sizes compared to institutional clients.
    C. Private clients are likely to have a more formal governance structure and a lower degree of investment sophistication compared to institutional clients.

2. Which of the following investments is *most likely* to be appropriate for a private client with a short investment horizon and high liquidity needs?
    A. Global bonds.
    B. Hedge funds.
    C. Private equity.

MODULE 28.2: INFORMATION AND SKILLS NEEDED WHEN ADVISING PRIVATE CLIENTS

Video covering this content is available online.

LOS 28.b: Discuss information needed in advising private clients.

LOS 28.c: Identify tax considerations affecting a private client's investments.

CFA® Program Curriculum, Volume 5, page 177, 180

Private wealth managers need to gather relevant client information to develop an understanding of their clients prior to formulating their investment objectives and assessing their risk tolerance.

Personal Information

Relevant personal information that a private wealth manager should determine in discussions with a client include:

- Family circumstances, including marital status and the number and age of dependents.
- Proof of client identification.
- Employment information, including future career aspirations.
- Retirement plans.
- Sources of wealth.
- Specific return or investment objectives.
- Risk tolerance.
- Investment preferences (e.g., liquidity or unique concerns).

The formulation of a client's investment objectives and risk tolerance are discussed in more depth later in the reading.

Financial Information

Wealth managers can construct a *net worth statement* of a private client to obtain a comprehensive understanding of the client's financial profile in terms of assets and liabilities.

A private client's assets on a net worth statement include:

- Cash and deposit accounts.
- Brokerage/investment accounts.
- Retirement accounts (e.g., defined contribution plan account or the present value of defined benefit pension).
- Other employee benefits (e.g., stock options).
- Stock/ownership of private companies.
- Life insurance policies with a cash value.
- Real estate.
- Other personal assets (e.g., cars, jewelry).

Liabilities on a net worth statement include:

- Consumer debt and credit card balances.
- Mortgage loans.
- Other types of debt (e.g., car loans and student loans).
- Margin debt in brokerage accounts.

Figure 28.1 illustrates a sample net worth statement for a private client.

Figure 28.1: Net Worth Statement

Assets (in thousands):		Liabilities (in thousands):	
Cash and bank deposits	500	Credit card debt	175
Brokerage account	1,500	Home mortgage	500
DC plan balance	1,450		

Home	750		
Other personal property	125		
Total Assets	**4,325**	**Total Liabilities**	**675**
		Total Net Worth	**3,650**

In addition to a client's assets and liabilities, wealth managers should seek an understanding of a client's annual income and expenses. Sources of income cash flows include a client's salary, pension income, business profits, and investment income. An analysis of income versus expenses is especially important for private clients who need to carefully budget in order to save toward their retirement goals.

> **PROFESSOR'S NOTE**
>
> The *economic* net worth statement extends an individual's assets to include *human capital* (present value of expected future labor income), while liabilities are extended to include *consumption* and *bequest* goals. This is covered in more detail in Reading 32.

Tax Considerations

Taxes on individuals vary by jurisdiction and must be considered in the IPS. Some general classifications of taxes are as follows:

- **Income tax.** Taxes paid on any form of income (e.g., wage, rental, dividend, interest, and capital gains).
- **Wealth-based taxes.** These include taxes paid on the value of certain types of assets (e.g., real estate) and taxes paid on the value of assets transferred to another individual through inheritance, gifts, etc.
- **Consumption tax.** These include sales taxes and value-added taxes.

Tax planning can be complex because the tax environment varies by jurisdiction. For example, some countries, like the United States, tax short-term capital gains on securities at the individual's highest marginal tax rate, while long-term capital gains on securities are usually taxed at a lower rate.

The effects of taxes must be considered when formulating the investment strategy and portfolio asset allocation for a private client. The following strategies can be used to reduce the adverse impact of taxes:

- **Tax avoidance.** This is not to be confused with illegal tax evasion. The private client can minimize taxes by utilizing investment accounts that are legally exempt from taxes on income and capital gains (e.g., Individual Savings Accounts in the United Kingdom). Some jurisdictions also allow limited gift amounts to be transferred without incurring wealth-based taxes.
- **Tax reduction.** The private client can invest in tax-free securities and/or securities that are more tax efficient (e.g., in jurisdictions where capital gains are taxed at a lower rate than income, securities that generate returns mainly as price appreciation offer the private client a lower effective tax rate).
- **Tax deferral.** The private client can minimize the compounding effect of taxes on portfolio returns by deferring the recognition of these taxes into the future. Strategies that fall under this category focus on long-term capital gains and low turnover. Tax deferral is also offered by retirement plans such as 403(b) retirement savings accounts.

These retirement plans permit tax-free contributions and earnings accumulation but require taxes to be paid on withdrawals.

> **For the Exam:** Calculations quantifying the benefits of utilizing the tax strategies previously discussed are covered in Reading 29.

Other Client Information

Additional information that a private wealth manager typically gathers for financial planning purposes includes:

- Wills and trust documents for estate planning.
- Insurance policies that the private client has taken out (e.g., life, disability).
- Service guidelines (e.g., whether the wealth manager is authorized to modify investment strategy and make trading decisions).
- Portfolio reporting requirements.
- Periodic liquidity requirements.
- Communications and information to share with other financial services professionals on behalf of the private client.

LOS 28.f: Describe technical and soft skills needed in advising private clients.

CFA® Program Curriculum, Volume 5, page 187

Private wealth managers need a combination of technical skills and soft skills to gather and utilize the information about their clients to formulate an investment strategy that will effectively address the goals, objectives, and constraints of their clients.

Technical skills include proficiency in financial planning; capital markets and asset classes; portfolio construction and monitoring; and technology skills.

Soft skills are essential for the interpersonal aspects of a client-advisor relationship and include communication, language, and social skills; education skills; and business development and sales skills.

MODULE QUIZ 28.2

To best evaluate your performance, enter your quiz answers online.

1. Ray McPherson, CFA, is meeting with a new private client, Henrietta Gove, to plan her investment strategy. McPherson has already established that Gove is 40 years old and works in internal audit for a publicly listed company. Gove mentioned several financial objectives during their last conversation and stated that she prefers low investment volatility. Gove's income more than adequately covers her expenses, and she would like to understand how her portfolio can fund a comfortable retirement lifestyle.

   List *five* additional pieces of personal information that McPherson should gather from Gove in order to prepare Gove's IPS.

2. A private wealth manager is educating her client on the importance of tax-efficient strategies. She makes the following three statements:

   Statement 1: I recommend that you change the asset location of your investment in high-coupon corporate bonds from a taxable account to a retirement account that allows tax-free earnings and withdrawals.

   Statement 2: You should reduce your exposure to dividend-paying equities in favor of a more tax-efficient asset class.

   Statement 3: If required, you should use an account that allows tax-free earnings but requires taxes to be paid on withdrawals.

   Identify the tax strategy (tax avoidance, tax deferral, or tax reduction) associated with each statement and give *one* reason for each answer.

3. Joan Cheong, CFA, just completed a portfolio review meeting with one of her private clients. Which of the following statements describes a soft skill that Cheong utilized in managing her client's portfolio?
   A. Cheong rebalanced her client's portfolio in accordance with the guidelines in her client's IPS.
   B. Cheong updated capital market expectations for the asset classes that are suitable for her client's portfolio.
   C. Cheong explained her client's portfolio performance in easy-to-understand terms and in her client's regional dialect.

MODULE 28.3: FORMULATING CLIENT GOALS AND EVALUATING RISK TOLERANCE

Video covering this content is available online.

LOS 28.d: Identify and formulate client goals based on client information.

CFA® Program Curriculum, Volume 5, page 182

Private wealth managers help their clients formulate and prioritize their financial goals. A private client's financial goals can be categorized into *planned goals* and *unplanned* goals.

Planned Goals

These are goals that can be *reasonably estimated* within a *specified time horizon*. Planned goals may include:

- Retirement goals (e.g., funding a comfortable existence post-retirement).
- Specific purchases (e.g., primary or secondary residence).
- Funding the education of dependents.
- Funding significant family events (e.g., wedding celebrations).
- Charitable giving.
- Wealth transfer during a private client's lifetime or at death.

Unplanned Goals

These goals are related to *unexpected financial expenditures*. Unplanned goals by their nature are more difficult to deal with because of the *uncertainty* associated with the *amount of expenditure* and/or *timing*. Examples of unplanned goals include unforeseen expenditures related to property repairs and unexpected medical expenses that are not covered by health insurance.

The Private Wealth Manager's Role in Formulating Client Goals

Private wealth managers can assist their clients in formulating their financial goals in the following ways:

- *Quantifying goals.* A private client may need assistance to formulate specific and realistic goals when these are difficult to quantify (e.g., funding a comfortable retirement).
- *Prioritizing goals.* When a private client has goals that are difficult to reconcile (e.g., purchasing a vacation property in retirement versus providing for the education of a client's dependents), the wealth manager can help the client identify the goals that have higher priority. Note that these may not necessarily be the ones that occur earlier in the client's time horizon.
- *Changing goals.* Private clients may decide to reevaluate their financial goals after a change in their financial circumstances. Wealth managers can assist clients in this process and in modifying their investment strategy.

> **EXAMPLE: Formulating client goals**
>
> Bonnie DuBois, a 60-year-old U.S. citizen, has just retired after a 35-year career in the fashion industry. Through a modest lifestyle, disciplined saving, and the help of a private wealth manager, she has accumulated a $2,000,000 diversified portfolio.
>
> DuBois resides in a house that has been paid off for several years. She estimates she will need $60,000 per year, with annual increases for inflation, to fund her lifestyle in retirement. One of the benefits of DuBois's past employment is comprehensive health insurance in retirement, but she is concerned that she might need long-term care in the future.
>
> In a recent conversation with her wealth manager, she mentions her desire to help support her son Barry, his wife Betty, and their three children (ages 14, 12, and 10). Barry's and Betty's combined salaries barely meet their living expenses currently as they hold relatively junior roles in their respective employment. DuBois expects to provide them with $30,000 per year for the next five years and states that supporting her son and his family is the most important priority for her because of its proximity timewise.

LOS 28.e: Evaluate a private client's risk tolerance.

CFA® Program Curriculum, Volume 5, page 185

A private wealth manager needs to understand a client's risk tolerance in order to formulate an appropriate investment strategy for the client. A private client's risk orientation can be described in several ways:

- **Risk tolerance.** This reflects both the client's *willingness* and ability to take risks. The opposite of risk tolerance is *risk aversion*.

- **Risk capacity.** This addresses a private client's *ability* to take financial risks, based on the client's wealth, income, investment horizon, liquidity requirements, importance of goals, and other relevant considerations. The *higher* the risk capacity, the *greater* the ability of the client's portfolio to sustain losses without putting the client's goals in jeopardy. Risk capacity is a *more objective* measure compared to risk tolerance, which can be viewed as more of an attitude toward risk.

> **For the Exam:** Generally, the ability to bear risk is decreased by:
> - A shorter time horizon.
> - Large critical goals in relation to the size of the portfolio.
> - Goals that are important to the client or those that cannot be deferred.
> - High liquidity needs.
> - Situations where the portfolio is the sole source of support or there is an inability to losses in value.

- **Risk perception.** This is defined as a *subjective* measure of investment risk (e.g., whether a private client thinks of investment losses in absolute or percentage

terms). Risk perception varies from one private client to the next; a wealth manager can play a part in influencing a client's risk perception.

🎓 PROFESSOR'S NOTE

Framing bias, a behavioral bias in which the answer given by an individual is affected by the way the question is asked or framed, is covered in Reading 8.

Private wealth managers can evaluate the risk tolerance of their clients using a combination of *questionnaires* and *conversations*. Conversations can yield additional information about a private client's risk tolerance (e.g., the client's past investment successes and failures; risk perception; and financial background and experiences) that may be difficult to obtain from questionnaires as well as enable the wealth manager to educate clients about investment risk.

When private clients have *multiple* financial goals, the wealth manager should determine the client's risk tolerance for each goal (e.g., a client may have a low risk tolerance for more important goals but higher risk tolerance for lower priority goals).

🎓 PROFESSOR'S NOTE

This is consistent with behavioral portfolio theory (covered in Readings 7 and 8), which suggests that investors construct their portfolios in layers with different return expectations and risk perceptions for each layer.

📋 MODULE QUIZ 28.3

To best evaluate your performance, enter your quiz answers online.

1. Vivian Collins is a client of ESP Financial Advisors. She presents her personal circumstances as follows:
   - Collins is 45 years old, divorced, and has a daughter, Daija, aged 15 years.
   - Collins has worked at her current job with the government for the last 23 years and assumes that she will remain there until retirement in 20 years when she will collect her pension. Currently, her employment income comfortably covers her living expenses.
   - She wants to be able to send Daija to the college of her choice and states that this is her highest priority goal as it will happen in the next 3–6 years.
   - Collins expects her daughter to eventually marry and have children, and she would love to be able to leave something to her future grandchildren.
   - Collins expects her pension to cover most of her retirement expenses and thinks she will need $20,000 per year from her modest investment portfolio to fund her retirement lifestyle.

   Identify the issues relating to Collins's goal quantification and goal prioritization.

2. As a client of ESP Financial Advisors, Vivian Collins, age 45, expects to retire in 20 years. Her financial advisor is evaluating her risk tolerance level associated with each of the following financial goals:

Retirement:	Collins views retirement as a long-term goal and is prepared to accept a 10%–15% drop in expected retirement spending. However, she is concerned that she might face unexpected health-related expenses in retirement.
College fees:	Collins wants to be able to pay for her daughter's college education in the next 3–6 years. Currently, this is her highest priority goal.
Gifting:	Collins would like to leave a gift to her grandchildren at her death.

Describe Collins's risk tolerance level associated with each of her financial goals as either *lower* or *higher*, and **justify** each answer.

MODULE 28.4: CAPITAL SUFFICIENCY ANALYSIS FOR CLIENT GOALS

Video covering this content is available online.

LOS 28.g: Evaluate capital sufficiency in relation to client goals.

CFA® Program Curriculum, Volume 5, page 190

Capital sufficiency (or capital needs) analysis enables private wealth managers to determine the likelihood of their clients being able to meet their financial objectives. This analysis can be performed using deterministic forecasting and Monte Carlo simulation.

Deterministic Forecasting

A traditional, deterministic, linear return analysis assumes that a private client's portfolio will achieve a *single compound annual growth* rate across the client's investment horizon. When using this approach, the wealth manager needs to establish the following inputs:

- Current value of the investment portfolio.
- Investment horizon.
- Annual return assumption (this should be based on forward-looking capital market assumptions rather than the simplistic use of historical returns).

- Contributions into the portfolio and cash flows out of the portfolio over the investment horizon.
- Impact of taxes, inflation, and investment management fees.

While deterministic forecasting is *easy to understand* and implement, its main disadvantage is that the use of a *single return assumption is not representative of the actual market volatility*.

Monte Carlo Simulation

While deterministic forecasting focuses on a single rate of return, Monte Carlo simulation allows input variables (which are similar to the inputs used with the deterministic approach) to be given a *probability distribution* to allow for real world uncertainty. If required, each asset class can be modeled with its own return and risk assumptions and the asset class's correlation with the returns of other asset classes instead of using a single portfolio return assumption. The Monte Carlo simulation then generates *a large number of independent trials,* consistent with the assumed probability distributions, with each trial showing one potential outcome at the end of the investment horizon. A wealth manager can then aggregate all the outcomes to *determine the probability that a client will achieve a financial goal* over the investment horizon. A key consideration when using Monte Carlo simulation is the *quality of the underlying assumptions* because, like any complex model, the output of a Monte Carlo simulation will only be as good as its inputs.

> **For the Exam:** Monte Carlo simulation is also discussed in other readings. You do not know how to actually do it, so the questions are likely to focus on interpreting the results of a simulation, as illustrated in the following example.

EXAMPLE: Interpreting Monte Carlo simulation results

A private wealth manager has performed a Monte Carlo simulation for a client who wants to gift $1,000,000 to a local art museum in 20 years. The results of the simulation for specific time intervals and percentiles are shown in Figure 28.2.

Figure 28.2: Monte Carlo Simulation Results for Client's Portfolio (Inflation Adjusted)

Percentile	Year 15 Portfolio Value	Year 20 Portfolio Value	Year 25 Portfolio Value
25th	$890,931	$1,339,655	$1,977,523
50th	$779,809	$1,103,982	$1,592,294
75th	$669,433	$883,247	$1,204,454
Successful trials	8%	61%	89%

From Figure 28.2, the wealth manager can conclude that 61% of trials met the client's financial objective after 20 years (i.e., the probability of success is 61%). Over the same time period, 50% of trials achieved a portfolio value in excess of $1,103,982 (the portfolio value at the 50th percentile), while 25% of trials achieved a portfolio value in excess of $1,339,655 (the portfolio value at the 25th percentile).

Wealth managers tend to use a *75%–90% probability of success* as a rule of thumb when advising private clients. If the probability of success is considered unacceptably low, a wealth manager could propose one or more of the following courses of action:

- Increase contributions over the investment horizon.
- Reduce the financial goal amount.
- Increase the time horizon for the financial goal.

- Pursue an investment strategy with higher expected returns while remaining within the client's risk tolerance.

While capital sufficiency analysis is a useful tool in financial planning, wealth managers should be careful not to pursue an investment strategy based only on its conclusions (it may not always be feasible to extend the time horizon for a financial goal in order to increase the probability of success).

MODULE QUIZ 28.4

To best evaluate your performance, enter your quiz answers online.

1. A private wealth manager has performed a Monte Carlo simulation for a client who wants to make a $2 million charitable donation in 25 years. The results of the simulation for the charitable donation (adjusted for inflation) are shown in the following table.

Percentile	Year 20 Portfolio Value	Year 25 Portfolio Value	Year 30 Portfolio Value
25th	$1,933,318	$2,907,062	$4,291,225
50th	$1,692,188	$2,495,637	$3,455,269
75th	$1,452,663	$2,116,646	$2,613,665
95th	$1,308,705	$1,751,233	$2,196,357

The probability that the client's goal will be met is *closest* to:
   A. 25%.
   B. 50%.
   C. 75%.

MODULE 28.5: PRINCIPLES OF RETIREMENT PLANNING

Video covering this content is available online.

LOS 28.h: Discuss the principles of retirement planning.

CFA® Program Curriculum, Volume 5, page 192

The principles underpinning retirement planning include the retirement stage of a private client's life, the analysis of the client's financial goals in retirement, and behavioral considerations.

Retirement Stage of Life

Private wealth managers work with their clients to establish how much they should save toward their financial goals and to determine when they will be financially able to retire. Since private clients do not always have a clear idea of their financial goals in retirement, a wealth manager has a role to play in influencing the retirement plans of their clients.

PROFESSOR'S NOTE

The financial stages of a private client's life are covered in more detail in Reading 32. We reproduce some of that material later to demonstrate how a private client's *human capital* (present value of expected future labor income) and *financial capital* (all the other assets of the private clients, such as financial savings and assets and tangible assets predominantly) change over the client's lifetime.

The following overview of the financial stages of life illustrates how retirement planning should start relatively early in the private client's adult life:

Education. The private client gains knowledge and skills through formal and informal education and apprenticeships. The emphasis in this stage of life is on *developing human capital* rather than saving for retirement.

Early career. The individual enters the workforce, often starts a family, and assumes other personal responsibilities. *Saving for retirement usually begins at this stage,* although there are many other competing financial goals.

Career development. After becoming established in a career, job skills can continue to expand and upward mobility increases. Financial obligations often increase to fund the college education of children. Successful individuals generally build financial capital and retirement savings over time.

Peak accumulation. Financial capital accumulation is typically greatest in the decade before retirement as human capital is converted into financial capital. Earnings and the need to accumulate funds for retirement (including pension benefits) are high. The private client also reduces liabilities, such as mortgage debt.

Preretirement. Emphasis continues to be on accumulating financial capital for retirement and reducing liabilities.

Early retirement. Private clients depend on cash flows from pension income (and part-time employment income in some cases) and their investment portfolio to fund their retirement lifestyle.

Late retirement. Expenses on leisure activities generally decrease, but uninsured health care expenses could increase, putting more pressure on financial resources.

One of the key challenges for a private wealth manager in the retirement stages of a client's life is *determining a rate at which distributions can be made* from the client's investment portfolio that can be maintained for the remaining lifetime of the client. This needs to be an ongoing process during the client's retirement in order to ensure that the investment portfolio can fully meet the client's financial goals in retirement.

Analysis of Retirement Goals

A private client's retirement goals can be analyzed using mortality tables, annuities, and Monte Carlo simulation.

Mortality tables. A mortality table shows *life expectancy for an individual at different ages* and enables a private wealth manager to determine the probability that a client will survive to a given age.

> **PROFESSOR'S NOTE**
>
> The probabilities of survival change every year. They are based on the individual's current age and show the probability for the *average individual* who has attained that age.

shows a sample mortality table for a client currently aged 72 with a life expectancy of 12 years. The table shows that the client has a 44% probability of living to 85 years and a 21% probability of reaching 90 years. These probabilities can be used to weight the expected annual cash flows of a client in retirement to estimate the present value of the client's retirement spending needs. It should be noted that, since mortality tables provide survival probabilities for an average individual, they might understate the actual probability

of a given private client reaching a specified age, meaning that the client is faced with *longevity risk* (i.e., the risk of outliving one's financial resources).

Figure 28.3: Sample Mortality Table

Client Age	Life Expectancy	Survival Probability
72	12.0	100%
73	11.4	97%
74	10.8	93%
75	10.2	90%
76	9.7	86%
77	9.1	82%
78	8.6	77%
79	8.1	73%
80	7.6	68%
81	7.2	64%
82	6.7	59%
83	6.3	54%
84	5.8	49%
85	5.5	44%
86	5.1	39%
87	4.7	34%
88	4.4	29%
89	4.1	25%
90	3.8	21%

Source: Adapted from 2020 CFA Level III curriculum, Volume 5, page 194, Example 6.

> **For the Exam:** While no explicit calculations using mortality tables are required in this reading, they are used to calculate *core capital* in the retirement stage of life in a later reading.

Annuities. The present value of the client's retirement spending needs can be determined by pricing an annuity. The buyer of an annuity makes an upfront payment in exchange for receiving a series of specified payments over time. An *immediate annuity* guarantees specified monthly payments for a predetermined period, with payments beginning immediately. Other types of annuities include a *deferred annuity*, where monthly payments begin at a specified time in the future, while a *life annuity* makes monthly payments for as long as the annuity holder is alive. If a private client's retirement spending needs are expected to be relatively stable over the client's life expectancy (from mortality tables), *a life annuity can be used to reduce longevity risk* and the price of a life annuity can be used as an estimate of the amount of financial resources required to fund the client's retirement goals.

Monte Carlo simulation. Monte Carlo simulation can be used to determine the probability that a private client's investment portfolio will meet the client's financial goals in retirement. The simulation can be *tailored to the client's actual portfolio asset allocation* and *used to explore different retirement scenarios*. This flexibility is important to private wealth managers because a client's retirement spending needs are usually *more complex than fixed monthly cash flows* (e.g., the client may wish to make a charitable donation before or at death).

As previously discussed, the output of a Monte Carlo simulation will only be as good as its input assumptions. Furthermore, *while the simulation provides the probability of success, it does not usually consider the amount by which the investment portfolio falls short of the client's retirement goals*. This *shortfall magnitude* is an important consideration for retirement planning, as the client will need to resolve this shortfall (e.g., reevaluate spending needs or other financial goals in retirement).

Behavioral Considerations When Advising Retirees

> **For the Exam:** Behavioral biases in individuals are covered in detail in Reading 8. The behavioral considerations in this reading focus primarily on *loss aversion, mental accounting,* and *self-control*.

Private wealth managers need to consider the following behavioral biases associated with retirees:

- **Increased loss aversion.** Compared to younger investors, retirees are likely to be more loss-averse, affecting their return assumptions and asset allocation decisions in retirement.
- **Consumption gaps.** Consumption spending by retirees tends to be *lower* than what economic studies forecast. This can be attributed to *loss aversion* and *uncertainty about future retirement spending*.
- **The annuity puzzle.** As discussed previously, life annuities can be used to reduce longevity risk. However, individuals tend to avoid buying annuities to meet their spending needs in retirement. Possible explanations for this annuity puzzle include (1) clinging on to the hope of funding a better retirement lifestyle, (2) a desire to keep control of assets, and (3) the high cost of annuities.
- **Mental accounting and self-control.** Retirees prefer to *meet their spending needs from investment income rather than by liquidating securities*. This preference for investment income over capital appreciation can be attributed to a lack of self-control when it comes to spending.

MODULE QUIZ 28.5

To best evaluate your performance, enter your quiz answers online.

1. When analyzing a client's retirement goals, a private wealth manager considers the probability that the client will live to a certain age and then predicts the client's retirement spending requirements using the probability that the client will still be living in a given year. When combined with the client's expected annual cash flows in retirement, this approach enables the wealth manager to estimate the present value of the client's retirement spending requirements. The approach that the wealth manager is *most likely* using is:
    A. the annuity method.
    B. Monte Carlo simulation.
    C. mortality tables.

2. The behavioral bias exhibited by retirees who prefer to meet their spending needs from investment income rather than by liquidating securities in their investment portfolio is *most likely* related to:
    A. consumption gaps.
    B. self-control bias.
    C. heightened loss aversion.

MODULE 28.6: THE INVESTMENT POLICY STATEMENT

LOS 28.i: Discuss the parts of an investment policy statement (IPS) for a private client.

LOS 28.j: Prepare the investment objectives section of an IPS for a private client.

CFA® Program Curriculum, Volume 5, page 197, 198

The IPS documents a private client's investment objectives, risk tolerance, investment time horizon, liquidity preferences, and any other preferences or constraints. The private wealth manager uses this information to construct the client's investment portfolio given the prevailing capital market conditions.

An IPS for a private client usually covers the following areas:

- Client background and investment objectives.
- Key investment parameters.
- Portfolio asset allocation.
- Portfolio management and implementation.
- Duties and responsibilities of the private wealth manager.

Client Background and Investment Objectives

A private client's background details are obtained from *personal*, *financial*, and *tax* information that the wealth manager has gathered on the client (discussed earlier in the reading). As part of the client's background, the private wealth manager should determine all the components of a client's investment portfolio as well as any other financial assets that the client may be holding outside the portfolio (e.g., with a different wealth manager) and cash flows from external sources (e.g., defined benefit pension).

We have already seen that clients may have *planned* and *unplanned* financial goals and objectives, which may be *ongoing* or *one-off* in nature. The private wealth manager should work with a client to *quantify* investment objectives wherever possible and reconcile *competing* objectives should they arise. Where a client has *multiple* objectives, the wealth manager can help the client *prioritize* these objectives into *primary* and *secondary* objectives.

As already discussed, a wealth manager can use *capital sufficiency* (or capital needs) *analysis* to determine the likelihood of their clients being able to meet their financial objectives and, where necessary, help clients revise these objectives to make them more realistic.

> **For the Exam:** Past exam questions have required candidates to specify risk and return objectives when preparing an IPS. In this reading, you are required to prepare investment objectives separately from risk tolerance, which is considered under investment parameters.

> **EXAMPLE: Preparing client investment objectives**
>
> William Elam recently inherited $750,000 in cash from his father's estate and has come to Alan Schneider, CFA, for investment advice. Both William and his wife, Elizabeth, are 30 years old. William is employed

as a factory worker and has an annual salary of $50,000. Although he receives total health care coverage for himself and his family, he makes no contributions to his firm's defined benefit pension plan and is not yet vested in any of the company's other retirement benefits. Elizabeth is an early childhood teacher with a salary of $38,000. She has only very recently opened a tax-deferred 403(b) retirement savings account. They have three children, aged eight, five, and three. They have a small savings account, no investments other than Elizabeth's retirement account, and credit card debt of $20,000.

When interviewed, William makes the following statements:

- "With a family of five, our combined salaries just meet our living expenses. It would be safe to assume that both our salaries and expenses will grow only at the rate of inflation."
- "We do not want to use our new wealth to improve our current lifestyle. Instead, we would like to grow the investment portfolio so that we can send our children to college and fund our retirement lifestyle when we stop working in 30 years."
- "We also want to set up a trust fund in the future for our children."

What are the key issues that Schneider should consider when preparing the investment objectives section of William's IPS?

Answer:

The purpose of William's investment portfolio is to pay for his children's college education, fund the retirement of him and Elizabeth, and set up a trust fund for his children. William has stated they do not want to use his inheritance to improve their current lifestyle. Since William and Elizabeth earn an income that covers their living expenses on an inflation-adjusted basis, distributions from the investment portfolio will begin when their children commence their college education in approximately 10 years (apart from paying off their credit card immediately). After paying for their children's college education, the couple will require distributions from the investment portfolio to set up the trust fund for their children and to fund their retirement.

Schneider should help the Elams *quantify* and *prioritize* their multiple investment objectives. He could use capital sufficiency analysis to determine the likelihood of these competing objectives being met given the size of the investment portfolio. He should also help them reevaluate and revise their current objectives if these objectives are not supported by capital sufficiency analysis.

Key Investment Parameters

A client's risk tolerance, time horizon, investment preferences, and constraints are covered in this section.

Risk tolerance. As discussed previously, risk tolerance considers a client's willingness *and* ability to accept investment risk. Generally, a client has a *low risk tolerance for more important goals* but higher risk tolerance for lower priority goals. An additional consideration is the proximity of the client's goals, with *near-term goals associated with lower risk tolerance* compared to longer-term goals. The process of evaluating a client's risk tolerance (e.g., questionnaires and/or conversations) is also covered in this section.

Time horizon. The investment horizon is often described as a *range* (e.g., in excess of 15 years for a long investment horizon or less than 10 years for a short horizon) rather than a specific length of time. Clients with multiple objectives can also have a different time horizon for each objective.

EXAMPLE: Time horizon

How should Schneider describe William's time horizon in the previous example?

Answer:

William has multiple objectives with different time horizons. The time horizon related to funding his children's college education exceeds 10 years. Assuming a trust fund is set up for his children after their college education, this time horizon is likely to exceed 20 years. Finally, the time horizon associated with retirement funding exceeds 30 years.

Asset class preferences. This section should list the *acceptable* asset classes for the client's portfolio (or alternatively asset classes that are unsuitable for the client), together with the risk-return characteristics of each asset class.

Liquidity preferences. Liquidity needs that have not been specified in the *Client Background and Objectives* section should be included here (e.g., the need for a cash reserve). A private wealth manager should also include liquidity preferences that may restrict investment in certain asset classes (e.g., a client's preference for dividend income may preclude investment in the stock of small, growth companies).

Other investment preferences. Some unique preferences include a concentrated position in a single stock (due to past employment or inheritance) and ethical investing.

Constraints. These client constraints restrict a private wealth manager's choice of investments or strategies for the client's portfolio (e.g., a client's preference for ethical investing).

> **For the Exam:** Past exam questions have required candidates to analyze a private client's time horizon, liquidity needs, taxes, legal and regulatory considerations, and unique preferences as investment constraints. *In this reading, risk tolerance, time horizon, liquidity preferences, other investment preferences, and constraints are analyzed as investment parameters, while taxes are included as part of the client's financial background information.*
>
> For the most part, you are provided with all the relevant information for a client's investment parameters in the story. A typical question might require you to address all the previously mentioned investment parameters in 10–12 minutes. You should give a brief factual answer for each parameter, supported by relevant facts from the story. If there are no issues to address for a particular parameter, say so in the answer rather than leaving it blank.
>
> Alternatively, a question may only ask you to address specific investment parameters and assign more minutes for each parameter. In this case, only address what is requested and provide more detail in your answer.

Portfolio Asset Allocation

This section describes the asset allocation approach that the private wealth manager will use for the client's investment portfolio. *Strategic* asset allocation indicates a long-term target allocation for each asset class, with the portfolio being rebalanced periodically to maintain the target allocation. *Tactical* asset allocation is an active management strategy that normally specifies a range for each asset class rather than a specific target allocation percentage.

Portfolio Management and Implementation

In order to effectively manage a client's investment portfolio on an ongoing basis, the private wealth manager needs clear guidance on the following issues:

Discretionary authority. This specifies the ability of the private wealth manager to take investment actions without first seeking the client's approval. Some clients give their wealth managers *full* discretion, whereas others prefer to *limit* discretionary authority to prespecified actions (such as rebalancing the portfolio in line with the agreed range for each asset class). A wealth manager providing a *nondiscretionary* service can make investment recommendations but is unable to act on the recommendation without client approval.

Rebalancing. The approach to rebalancing a client's investment portfolio should be clearly

specified in the IPS. A *time-based* rebalancing (e.g., quarterly, semiannual, or annual rebalancing) does not consider deviations between actual and target asset class percentages, whereas a *threshold-based* rebalancing approach means that the portfolio is rebalanced once actual asset class weights deviate from target weights by a prespecified amount.

Tactical changes. The IPS should clearly state if a private wealth manager is given discretionary authority to undertake tactical asset allocation changes. The IPS should clearly state the acceptable range of weights for each asset class as well as the extent to which the manager is allowed to go beyond the upper or lower bounds when making tactical changes.

Implementation. This section covers information about acceptable investment vehicles (e.g., the use of in-house and/or external money managers, ETFs, mutual funds) and the due diligence process for making investment decisions.

Duties and Responsibilities of the Private Wealth Manager

The general responsibilities of a private wealth manager in helping a client meet their investment objectives are detailed in this section. These responsibilities include:

- Formulating and reviewing the IPS, including frequency of review.
- Recommending or selecting investment options and constructing the investment portfolio's asset allocation.
- Monitoring and rebalancing the portfolio.
- Monitoring portfolio implementation costs.
- Monitoring the third-party service providers.
- Reporting portfolio performance.
- Reporting taxes and financial statements.
- Voting proxies.

IPS Appendix

This section includes details of items that typically change more frequently than other sections of the IPS, such as the following:

- *Modeled portfolio performance.* This typically describes a range of possible portfolio outcomes over different investment horizons as well as a distribution of returns at specific percentiles.
- *Capital market expectations.* This covers the expected return, risk, and correlations of the asset classes that the private wealth manager can include in a client's portfolio.

LOS 28.k: Evaluate and recommend improvements to an IPS for a private client.

CFA® Program Curriculum, Volume 5, page 202

The following example illustrates how you could be tested on an IPS for a private client. The nature of constructed response questions gives you some latitude in developing an acceptable answer and, in some cases, there may be more than one acceptable answer. You will be graded on whether you answer the questions in a way that is consistent with what is taught in the curriculum.

EXAMPLE: Evaluating an IPS for a private client

Bonnie DuBois, a 65-year-old U.S. citizen, has been retired for 5 years. Over that period, she has helped to support her son, Barry, and his family. DuBois's son and his wife, Betty, have both received significant promotions, so they no longer require her support.

DuBois is meeting with her financial advisor, Begren Knutsen, CFA, to determine if and how her IPS should be altered. She does not intend to change her modest lifestyle, and since she no longer needs to provide financial support to her son and his family, DuBois will instead plan bequests. She also specifies that the portion of the portfolio allocated to equities should use only domestic equities.

When Knutsen reviewed DuBois's IPS a year ago, she did not recommend any changes to the IPS or investment strategy. The value of DuBois's portfolio remains unchanged at $2 million. DuBois and Knutsen estimate her investment horizon will exceed 15 years. DuBois's highest priority is to be able to withdraw $75,000 per year on an inflation-adjusted basis to cover her living expenses. As unexpected expenses are likely to increase, she states the portfolio's cash reserve should be raised to $25,000. She also plans to leave a bequest of $1.2 million each to her son and to a local museum ($2.4 million in total) at her death.

Knutsen and DuBois have agreed to review her objectives, investment parameters, and asset allocation considerations at this meeting so that Knutsen can model DuBois's portfolio behavior with updated capital market assumptions. The sections of DuBois's current IPS that will be discussed at the meeting are shown in Figure 28.4. DuBois does not require any changes to be made to the *Portfolio Management, Responsibilities, and Review* sections of her IPS.

Discuss the changes that Knutsen should make to DuBois's original IPS to incorporate her *new retirement objectives* and *investment preferences*. You are *not* required to provide any specific asset class weights for the portfolio asset allocation as part of your answer.

Figure 28.4: Excerpts From Bonnie DuBois's Original Investment Policy Statement

Background and Investment Objectives

This investment policy statement (IPS) has been created for Bonnie DuBois for the purpose of meeting her financial objectives. It outlines her objectives and investment parameters, recommends an investment strategy for achieving these objectives, and details ongoing duties and responsibilities.

The objectives of this portfolio are to support the retirement lifestyle of DuBois, support her son and his family for one year, and gift her estate to a local museum at her death. The financial support for her son and his family is her primary objective, followed by the maintenance of her current lifestyle and her charitable donation at death. In order to achieve these objectives, DuBois anticipates needing her portfolio to distribute $90,000 per year on an inflation-adjusted basis. DuBois has not specified a specific monetary amount that she intends to gift to a local museum at death. The wealth manager will work with DuBois on an ongoing basis to quantify this objective.

DuBois's current portfolio of $2 million is held in a taxable account and a tax-deferred account. Expected cash distributions have been given due consideration when constructing her portfolio asset allocation. As her investment horizon is relatively long-term, she is seeking to achieve a higher rate of return commensurate with her risk tolerance.

Investment Parameters

Risk tolerance. DuBois is able and willing to accept volatility in the short and medium term. She acknowledges that this risk tolerance has been reflected in her current asset allocation.

Investment horizon. DuBois has an investment horizon that exceeds 15 years.

Asset class preferences. DuBois and her wealth manager have determined that the following asset classes are appropriate for her portfolio:

- Cash and money market instruments.
- Domestic government bonds.
- Domestic corporate bonds.
- Global government bonds.
- Domestic equities.
- Global equities.
- Domestic real estate securities.
- Commodities.

Other investment preferences. DuBois wishes to maintain her position in Chic Apparel, Inc., where she spent most of her 35-year career in the fashion industry before retiring. This position does not represent a significant concentration risk in her portfolio and stocks of Chic Apparel are actively traded on the domestic stock exchange.

Liquidity preferences. DuBois wishes to maintain a $10,000 cash reserve within her portfolio.

Constraints. DuBois's position in Chic Apparel has significant embedded capital gains.

Portfolio Asset Allocation (Strategic Allocation With Rebalancing Limits Provided in Brackets)

Cash and money market instruments	5% (4%–6%)
Domestic government bonds	10% (8%–12%)
Domestic corporate bonds	10% (8%–12%)
Global government bonds	10% (8%–12%)
Domestic equities	40% (35%–45%)
Global equities	10% (8%–12%)
Domestic real estate securities	10% (8%–12%)
Commodities	5% (4%–6%)

Answer:

DuBois's IPS needs to be modified to reflect her new investment objectives and parameters. These changes are detailed later.

Background and Investment Objectives

Since DuBois no longer needs to support her son and his family, her primary objective is now her retirement lifestyle. She also plans to leave a bequest of $1.2 million each to her son and to a local museum.

The second paragraph of the *Background and Investment Objectives* section of her current IPS should be modified as follows:

> The objectives of this portfolio are to support the retirement lifestyle of DuBois and to leave a bequest of $1.2 million each to her son and a local museum ($2.4 million in total) at her death. The financial maintenance of her retirement lifestyle is her primary objective, followed by the bequests to her son and a local museum at death. DuBois anticipates needing her portfolio to distribute $75,000 per year on an inflation-adjusted basis to cover her living expenses. The wealth manager will work with DuBois to ensure that her portfolio distribution rate is sustainable throughout retirement and reevaluate her other financial objectives if these are not supported by capital sufficiency analysis.

Investment Parameters

Risk tolerance. No changes required.

Investment horizon. No changes required, as it is still reasonable to expect her investment horizon to exceed 15 years.

Asset class preferences. DuBois states that her portfolio allocation to equities should only consist of domestic equities. Her wealth manager should advise her on the potential return and diversification implications of her decision. Mean-variance optimization of DuBois's portfolio should incorporate the constraint on investment in foreign equities.

The wording for asset class preferences should be modified as follows:

> DuBois and her wealth manager have determined that the following asset classes are appropriate for her portfolio:
>
> - Cash and money market instruments.
> - Domestic government bonds.
> - Domestic corporate bonds.
> - Global government bonds.
> - Domestic equities.
> - Domestic real estate securities.
> - Commodities.

Other investment preferences. No changes required.

Liquidity preferences. DuBois wishes to increase the cash reserve from $10,000 to $25,000. This change should be clearly stated as follows:

> DuBois wishes to maintain a $25,000 cash reserve within her portfolio.

Constraints. This section should be modified as follows to incorporate the constraint on investment in foreign equities:

> DuBois's portfolio allocation to equities should consist only of domestic equities. DuBois's position in Chic Apparel has significant embedded capital gains.

MODULE QUIZ 28.6

To best evaluate your performance, enter your quiz answers online.

1. A private wealth manager has gathered the following information from a new client:

Risk tolerance:	Low
Liquidity needs:	$2 million for purchase of holiday apartment in 2 years
Asset class preferences:	No investment in commodities and hedge funds

   What information is *most likely* to be included in the *Investment Objectives* section of the client's IPS?
   - A. Low risk tolerance.
   - B. $2 million purchase of holiday apartment in 2 years.
   - C. Investments in commodities and hedge funds have not been approved by client.

2. Which of the following investment considerations is *most likely* to be included as a constraint in a client's IPS?
   - A. ESG investing.
   - B. Time horizon.
   - C. Liquidity preferences.

3. Which of the following items is *most likely* to be included in the *Portfolio Management* section of a client's IPS?
   - A. Capital market expectations.
   - B. Modeled portfolio behavior.
   - C. Portfolio rebalancing methodology.

4. The requirement for a client's investment portfolio to hold a cash reserve and/or constraint on asset class selection because of the need to sell the portfolio relatively quickly is *most likely* to be included in:
   - A. the *Liquidity Preferences* section of the client's IPS.
   - B. the *Other Investment Preferences* section of the client's IPS.
   - C. the *Portfolio Asset Allocation* section of the client's IPS.

5. Vivian Collins is a client of ESP Financial Advisors. She is 45 years old and expects to retire in 20 years. Her financial advisor has determined that Collins has the following financial goals:

Retirement:	Collins views retirement as a long-term goal and is prepared to accept a 10%–15% drop in expected retirement spending. However, she is concerned that she might face unexpected health-related expenses in retirement.
College fees:	Collins wants to be able to pay for her daughter's college education in the next 3–6 years. Currently, this is her highest priority goal.

Gifting: Collins would like to leave a gift to her grandchildren at her death.

Which of the following descriptions of Collins's investment time horizon is her financial advisor *most likely* to include in her IPS?

A. Collins has a long horizon of 35 years, as she would expect to survive until 80 years old.

B. Collins has multiple time horizons: the college fees goal has a time horizon of 3 years, the retirement goal has a time horizon of 20 years, and the gifting goal has a time horizon of 35 years.

C. Collins has multiple time horizons: the college fees goal has a time horizon exceeding 3 years, the retirement goal has a time horizon exceeding 20 years, and the gifting goal has a time horizon exceeding 35 years.

MODULE 28.7: PORTFOLIO CONSTRUCTION

LOS 28.l: Recommend and justify portfolio allocations and investments for a private client.

CFA® Program Curriculum, Volume 5, page 207

After developing a private client's IPS, a wealth manager constructs the client's investment portfolio to implement the client's investment strategy. A traditional approach and a goals-based investing approach to portfolio construction are discussed next.

Traditional Approach to Portfolio Construction

The traditional approach to constructing a private client's portfolio views risk in an *overall portfolio* context and consists of the following steps:

- Identify appropriate asset classes for the client's portfolio.
- Develop capital market expectations (i.e., expected returns, standard deviations, and correlations of asset classes).
- Determine asset class weights for the portfolio, consistent with the client's risk tolerance for the *overall* portfolio.

> **For the Exam:** Asset allocation approaches, such as mean-variance optimization (MVO) and Monte Carlo simulation, are covered in an earlier reading. A private wealth manager can use these approaches to establish an *optimal* portfolio that maximizes expected return for a specified level of risk consistent with a client's risk tolerance. As the optimal portfolio may include asset class allocations that are impractical to implement, the wealth manager may need to specify *asset class constraints* in the optimization process. The wealth manager *may also need to modify the optimal asset class weights to incorporate client preferences* (while remaining within acceptable risk limits) in the recommended portfolio allocation.

- Assess investment constraints (e.g., a client's preference for ethical investing) that may limit the wealth manager's choice of investments.
- Implement the portfolio.

> **For the Exam:** Key considerations when implementing the portfolio include:
> - Use of active or passive management (or a combination) for each asset class.
> - Degree of focus on specific sectors of each asset class (e.g., style factors for equity and credit quality for fixed income).

EXAMPLE: Traditional approach to portfolio construction

Max Davidson is a 45-year-old heart surgeon who plans to retire in 15 years. Davidson is generally conservative with his investments and does not like portfolio volatility. His private wealth manager, Janine Becker, CFA, has determined that a portfolio standard deviation of 8% would be acceptable to Davidson. Davidson has stated a preference for bonds and large-cap equities in his investment portfolio.

Becker decides to use MVO to determine the optimal asset allocation for Davidson's portfolio based on the capital market expectations that she has developed. She specifies a minimum weight of 5% for real estate in the optimization because of its potential diversification benefits. She then modifies the optimal portfolio allocation to take into account Davidson's preferences. The optimal and recommended asset allocations for Davidson's portfolio are shown in Figure 28.5.

Figure 28.5: Asset Allocation for the Davidson Portfolio (Traditional Approach)

Asset Class	Allocation From MVO	Recommended Allocation
U.S. government bonds	32.5%	32.5%
Other investment-grade bonds	22.5%	25.0%
Large-cap equities	20.2%	25.0%
Other equities	14.8%	12.5%
Real estate	10.0%	5.0%
Total	**100.0%**	**100.0%**
Expected return	6.0%	5.9%
Volatility (in terms of standard deviation)	8.0%	8.0%

Goals-Based Investing

Goals-based investing essentially follows the same steps as the traditional approach to portfolio construction, the critical difference being that instead of constructing a single portfolio, the private wealth manager creates *separate portfolios for each of the client's goals.* Mean-variance optimization, which can be structured to maximize expected returns for a given level of risk or to meet a specified probability of success, is carried out for each goal portfolio rather than for the entire portfolio.

> **PROFESSOR'S NOTE**
>
> This is another illustration of behavioral portfolio theory (covered in Readings 7 and 8), which suggests that investors construct their portfolios in layers with different return expectations and risk perceptions for each layer.

With goals-based investing, clients may find it *easier to specify their risk tolerance,* as this is expressed for each goal portfolio rather than for the client's entire portfolio. A key *disadvantage* of this approach is that the client's entire portfolio may not be mean-variance efficient. This is because the overall allocation of the entire portfolio will depend on the aggregated asset class allocations of the goal portfolios and is unlikely to be as well diversified as the optimal portfolio obtained using the traditional approach.

MODULE QUIZ 28.7

To best evaluate your performance, enter your quiz answers online.

1. Rayyan Patel, CFA, has performed MVO to determine the optimal asset allocation for a client's portfolio, having determined that the maximum portfolio volatility that the client can tolerate is 9%. The MVO portfolio allocation together with three alternative portfolio allocations that Patel is considering are shown in the following table.

Asset Class	Allocation from MVO	Alternative 1 Allocation	Alternative 2 Allocation	Alternative 3 Allocation
Investment-grade bonds	30.5%	35.0%	32.0%	30.0%
High-yield bonds	15.0%	12.0%	10.0%	15.0%
U.S. equities	38.2%	38.0%	30.0%	20.0%
Other (non-U.S.) equities	12.8%	10.0%	20.0%	25.0%
Commodities	3.5%	5.0%	8.0%	10.0%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Expected return	6.5%	6.1%	6.4%	6.6%
Volatility (in terms of standard deviation)	9.0%	8.7%	8.9%	9.2%

If Patel wants to adjust the portfolio allocation to incorporate his client's preference for non-U.S. equities and alternative investments, which of the following portfolio allocations is he *most likely* to recommend to his client?

    A. Alternative 1.
    B. Alternative 2.
    C. Alternative 3.

MODULE 28.8: PORTFOLIO REPORTING AND REVIEW, AND EVALUATING AN INVESTMENT PROGRAM

LOS 28.m: Describe effective practices in portfolio reporting and review.

CFA® Program Curriculum, Volume 5, page 211

Portfolio reporting enables private clients to understand how their investment portfolio is performing and whether their financial goals are likely to be achieved. It provides a basis for a private wealth manager to review a client's IPS and investment strategy with the client to determine if changes are required to achieve the client's goals.

Portfolio Reporting

A portfolio report for a private client typically includes the following items:

- Performance summary for the current period.
- Market commentary for the current period to provide context for the portfolio's performance.
- Portfolio asset allocation at the end of the current period, including strategic asset allocation weights or tactical asset class target ranges.
- Detailed performance of asset classes and individual securities.
- Benchmark report comparing asset class and overall portfolio performance to appropriate benchmarks.
- Historical performance of client's investment portfolio since inception.
- Transaction details for the current period (e.g., contributions, withdrawals, interest, dividends, and capital appreciation).
- Purchase and sale report for the current period.
- Impact of currency exposure and exchange-rate fluctuations.
- Progress toward meeting goal portfolios when using a goals-based investing approach.

> **For the Exam:** Be prepared to identify three or four items from the preceding list that could be added to a client's portfolio report to improve the client's understanding of portfolio performance.

Note that the *horizon mismatch* between quarterly (or annual) portfolio reports and the significantly longer investment horizon of a client can potentially distort a client's perception of the portfolio's long-term effectiveness. The portfolio reporting and review process enables the private wealth manager to provide context to investment performance for the current period and to manage a client's expectations appropriately.

Portfolio Review

A portfolio review enables the private wealth manager to reassess a client's IPS and investment strategy in light of recent performance to determine if changes are required. A portfolio review typically addresses the following areas:

- Appropriateness of client's existing goals and investment parameters and if any changes are required.
- Rebalancing of portfolio asset allocation to target allocation or ranges.
- Any changes to the wealth manager's ongoing management of the portfolio (e.g., degree of discretionary authority).
- Any changes or updates in the wealth manager's duties and responsibilities.
- Any changes to IPS and portfolio review frequency.

LOS 28.n: Evaluate the success of an investment program for a private client.

CFA® Program Curriculum, Volume 5, page 214

The degree to which a private client's investment program is considered a success is measured in terms of three criteria: goal achievement, process consistency, and portfolio performance.

Goal Achievement

An investment program is considered a success if it *fulfills a client's goals within the specified risk parameter*. Due to the ongoing nature of the investment program, the criteria for success should be whether it is *still likely to meet the client's longer-term goals* (e.g., using capital sufficiency analysis) *without a significant change in the original strategy*. For example, an investment program that now requires a client to contribute a much larger amount per year (compared to the original investment plan) toward a goal of achieving a lump sum target at retirement is unlikely to be considered a success.

Process Consistency

The success of an investment program depends on the consistency of processes that the manager uses. The following issues are typically considered in evaluating process consistency:

- Has the wealth manager implemented an investment strategy that is consistent with the client's goals and investment preferences?
- Is the wealth manager maintaining regular communications with the client to assess the need for changes to the IPS?
- How have recommended third-party investment managers performed relative to their benchmarks?
- What is the impact of recommended fund manager switches on portfolio performance?
- How has the use of tactical asset allocation affected portfolio performance (if applicable)?
- Has the rebalancing process followed IPS guidelines?
- What tax-efficient strategies have been employed for the portfolio?

- How has the wealth manager tried to reduce portfolio costs and expenses?

Portfolio Performance

Portfolio performance can be measured against an *absolute* performance benchmark (e.g., 5% fixed return) or *relative* to a passive benchmark (e.g., return on a domestic stock index). The impact of investment risk can be evaluated by comparing the *risk-adjusted return* (e.g., Sharpe ratio) of the client's portfolio and an appropriate benchmark and by comparing the portfolio's *downside risk* with the client's risk tolerance. Private wealth managers need to recognize that clients generally prefer to evaluate portfolio performance against benchmarks that they are familiar with (such as domestic equity indexes) and take this preference into consideration in the portfolio construction, reporting, and review process.

Definition of success. Private wealth managers and their clients should ideally agree on the measures of success at the inception of the investment program (e.g., whether to measure portfolio performance in absolute or relative terms) to avoid misunderstandings further down the line.

> **For the Exam:** Questions are likely to ask you to evaluate a client's investment program against the three criteria previously discussed. An investment program can be said to be successful only if it achieves success on *all* three criteria.

> **EXAMPLE: Evaluating an investment program**
>
> Jamie George, CFA, has worked as a private wealth manager for Susan Montana for the last 15 years. Montana's goals have not changed over time, and she expects to retire in five years. The primary goals for her investment portfolio are to support her retirement lifestyle and to make an annual donation to her favorite charity in retirement.
>
> Montana's portfolio has outperformed its benchmark by 0.2% over this period, while portfolio volatility has been slightly lower than the benchmark. The portfolio's return has also exceeded the rate of return that George used in the capital sufficiency analysis of Montana's portfolio 15 years ago. The output of his most recent capital sufficiency analysis indicates that the current portfolio and investment strategy are very likely to meet Montana's future goals.
>
> After reviewing her IPS, Montana concludes that George has followed the process stated in the IPS. George has maintained an ongoing dialog with Montana, followed rebalancing guidelines, and reduced trading costs over time.
>
> **Evaluate** the success of Montana's investment program under George's management.
>
> **Answer:**
>
> Montana's investment program has been successful when assessed against the following criteria:
>
> - *Goal achievement*—Montana's portfolio return has exceeded the rate of return that George used in the original capital sufficiency analysis, and the output of his most recent capital sufficiency analysis indicates that the investment strategy is very likely to meet her future goals without the need for any meaningful changes.
> - *Process consistency*—George has followed a consistent process in managing Montana's portfolio. This includes maintaining an ongoing dialog with Montana, following rebalancing guidelines, and reducing trading costs over time.
> - *Portfolio performance*—Montana's portfolio has outperformed its benchmark over the last 15 years, with lower volatility compared to the benchmark.

MODULE QUIZ 28.8

To best evaluate your performance, enter your quiz answers online.

1. Zach Bond, CFA, provides quarterly portfolio reports to his clients. Each portfolio report contains the following information:

   - Performance summary for the current quarter.
   - Portfolio asset allocation at the end of the quarter, including strategic asset allocation weights or tactical asset class target ranges.
   - Detailed performance of asset classes and individual securities.
   - Benchmark report comparing asset class and overall portfolio performance to appropriate benchmarks.

   List *four* additional items that Bond could provide to improve the quality of the portfolio reports that he prepares for his clients.

2. Christine Tan is preparing to meet Zach Bond, CFA, who has acted as her wealth manager for the last 20 years. Over this period, her portfolio has earned a 6% compound annual return, matching the annual return modeled by Bond in his capital sufficiency analysis of Tan's portfolio 20 years ago. The output of his most recent capital sufficiency analysis indicates that the current portfolio and investment strategy are very likely to meet Tan's future financial objectives. Tan's portfolio return has underperformed its benchmark by 0.3% over this period, while matching the benchmark's volatility. Tan notes that Bond has followed the guidelines laid out in her IPS in relation to ongoing communications, rebalancing methodology, tax strategies, and implementation costs.

   Tan is *most likely* to conclude that her investment program has:
   A. failed because it has not met all three criteria of a successful investment program.
   B. been a success because it has met two out of the three criteria of a successful investment program.
   C. been a success because it has met all three criteria of a successful investment program.

MODULE 28.9: ETHICAL AND COMPLIANCE CONSIDERATIONS, AND PRIVATE CLIENT SEGMENTS

Video covering this content is available online.

LOS 28.o: Discuss ethical and compliance considerations in advising private clients.

CFA® Program Curriculum, Volume 5, page 216

Private wealth managers need to fulfill many ethical and compliance requirements when advising their clients and managing their investment portfolios. These requirements are briefly discussed in the following sections.

Ethical Considerations

A private wealth manager should use the CFA Institute Code of Ethics and Standards of Professional Conduct as a basis for managing and resolving ethical issues and conflicts. Some of the more relevant ethical considerations are listed here:

Fiduciary duty and suitability. Assessing the suitability of potential investments for a private client is an important component of a wealth manager's fiduciary duty. Fiduciary duty

and suitability considerations are covered in the following Standards of Professional Conduct:

- Standard I(B) *Independence and Objectivity*.
- Standard III(A) *Loyalty, Prudence, and Care*.
- Standard III(C) *Suitability*.
- Standard V(A) *Diligence and Reasonable Basis*.

Know your customer. The know your customer (KYC) rule requires private wealth managers to obtain relevant personal and financial information about their clients for portfolio management purposes as well as for regulatory compliance (e.g., money laundering investigations). KYC requirements are covered in Standard III(C) *Suitability*.

Confidentiality. Client confidentiality is a key tenet of a wealth manager–client relationship and can be a challenge when a private wealth manager's clients are known to each other (e.g., business associates). Standard III(E) *Preservation of Confidentiality* deals with the main considerations in client confidentiality.

Conflicts of interest. Private wealth managers may face potential conflicts of interest if their fee- or commission-based compensation structure influences the provision of investment advice and recommendations to their clients. Relevant considerations are covered in Standard I(B) *Independence and Objectivity* and Standard VI(A) *Disclosure of Conflicts*.

> **EXAMPLE: Ethical considerations**
>
> Jacob Windfall, CFA, is a portfolio manager for Fastrack Advisors, Inc. Fastrack has recently introduced a bonus system that rewards portfolio managers if their client portfolios outperform the benchmark each quarter. In order to enhance the short-term performance of his client portfolios, Windfall is considering purchasing a significant amount of stock in smaller companies with high betas for these portfolios even though he has not recommended any changes in investment strategy for his client portfolios this year.
>
> Are there potential ethical considerations for Windfall's investment actions?
>
> **Answer:**
>
> Windfall faces a potential conflict of interest if the stock purchases are inconsistent with the IPSs of his clients and, therefore, are unsuitable for their portfolios. He should analyze his intended course of action objectively and disclose this potential conflict of interest to his clients.

Compliance Considerations

Regulatory requirements for private wealth managers vary by jurisdictions. For example, the *Markets in Financial Instruments Directive (MiFID II)* requires investment advisors to demonstrate the suitability of investment advice and meet threshold competence levels.

> **For the Exam:** You are not required to be a compliance expert, but be prepared to state that private wealth managers must fulfill regulatory requirements as part of their responsibilities to clients if an exam question asks you to identify compliance considerations.

LOS 28.p: Discuss how levels of service and range of solutions are related to different private clients.

CFA® Program Curriculum, Volume 5, page 219

Private wealth management firms tailor their levels of service and range of solutions to the different private client segments that they serve. Typical categories of private clients include the mass affluent, high net worth, and ultra-high net worth segments.

Mass Affluent Segment

The mass affluent segment requires a *wide range of wealth management services*, such as portfolio construction, risk management, and retirement planning. It is characterized by a *larger number of clients per wealth manager* and *greater use of technology* in delivering services such as account creation and portfolio reporting. Due to the larger client-to-wealth-manager ratio, wealth managers do not tend to tailor their portfolio management approach for each client. Compensation for wealth managers in this segment can be based on *commissions* from investment transactions for the client (brokerage model) or *fees* linked to assets under management.

High-Net-Worth (HNW) Segment

The HNW segment exhibits a *smaller number of clients per wealth manager* compared to the mass affluent segment. Wealth management services provided in this segment are more likely to concentrate on *tailored investment solutions*, *tax planning*, and *estate planning*. The portfolios of HNW clients are more likely to contain *sophisticated* strategies (e.g., derivatives-based) and *alternative investments*. Estate planning considerations may also result in *longer investment horizons* and *greater risk capacity*.

Ultra-High-Net-Worth (UHNW) Segment

This segment is likely to have *multigenerational investment horizons*, *complex tax and estate planning*, and a *more comprehensive range of service requirements*, including ancillary services (e.g., travel planning) and advice on luxury investments (e.g., art and automobiles). The UHNW segment has a relatively *low client-to-manager ratio* because of the need to provide a *highly customized service* to clients.

A UHNW wealth manager typically manages the portfolios of multigenerational family members, requiring consideration of *family governance and inheritance issues*. UHNW clients are more likely to be serviced by a *client relationship team* that includes legal, tax, and investment experts in addition to a relationship manager. Some UHNW individuals may also choose to employ a *family office* of financial experts to manage their assets.

Robo-Advisors

Robo-advisors are *automated* wealth management advisors that assist private clients with their portfolio management needs. Robo-advisors gather client information using *online questionnaires* and recommend an appropriate asset allocation for the client's portfolio using mean-variance optimization or alternative techniques. The client's portfolio is constructed using *exchange-traded funds* or *mutual funds* and monitored on an ongoing basis. Periodic rebalancing and online performance reporting are also provided to the client.

Because of the automated client interface, the *costs associated with using robo-advisors are lower* than the fees charged by traditional private wealth managers. The *scalable* technology associated with robo-advisors also enables their services to be provided to clients with small portfolios in a cost-effective manner.

Robo-advisors are increasingly being employed by private clients for *more sophisticated* purposes (e.g., to fulfill unique investment preferences and for tax-efficient investing). They can also be used in combination with traditional private wealth managers to lower fees and to reach new private client segments.

EXAMPLE: Private client segments

List *three* key differences between the mass affluent and HNW private client segments.

Answer:

Three key differences between the mass affluent and HNW segments are as follows:

- The mass affluent segment has a larger client-to-manager ratio than the HNW segment.
- The portfolios of HNW clients are more likely to contain sophisticated investment strategies and alternative investments.
- Wealth managers are more likely to develop customized investment solutions for HNW clients rather than for clients in the mass affluent segment.

MODULE QUIZ 28.9

To best evaluate your performance, enter your quiz answers online.

1. Shane Long, CFA, works as a wealth manager for the London branch of a prestigious Swiss private bank. Long is meeting a prospective client, Anna Bradescu, for the first time. In a telephone conversation with Bradescu two days ago, she mentioned that she owns penthouse apartments in Paris, New York, Hong Kong, and Tokyo. At the meeting, she provides Long with her personal calling card that includes an address in one of the most exclusive residential areas of London. Long politely asks Bradescu for her passport and bank account details and enquires about her family circumstances and sources of wealth. The ethical consideration that Long is *most likely* concerned about is:
   A. KYC.
   B. confidentiality.
   C. conflicts of interest.

2. Shane Long, CFA, has just concluded his first meeting with a prospective client, Anna Bradescu. Based on the information that Bradescu has provided, Long believes that Bradescu should be classified as an ultra-high net worth (UHNW) client. Which of the following is *most likely* a characteristic of the UHNW segment?
   A. High client-to-manager ratio.
   B. Complex tax and estate planning considerations.
   C. Greater use of technology in providing wealth management services.

3. The growth of robo-advisors in the wealth management industry is *most likely* driven by:
   A. cost considerations.
   B. the superior ability of robo-advisors to develop sophisticated investment strategies.
   C. the desire to have primarily human interaction for wealth advice coupled with automated portfolio construction, rebalancing, and reporting services.

LOS 28.a

Investment Objectives

Private clients have a wide range of investment objectives that (1) may not be precisely defined, (2) can change over time, and (3) may be difficult to reconcile.

Institutional clients have more stable, clearly defined objectives.

Constraints

- Private clients have shorter time horizons compared to institutional clients. Private clients may also have different time horizons for different objectives compared to a single time horizon for institutional clients.
- Private client portfolios tend to be smaller than those of institutional clients, meaning that some types of alternative investments may be unsuitable for private client portfolios.
- Tax planning is an important consideration for private clients.

Other Considerations

Institutional clients tend to have a more formal governance structure and higher investment sophistication compared to private clients.

The regulatory environment and investor uniqueness and complexity are additional considerations for private clients.

LOS 28.b

Personal information that should be gathered for a private client includes family circumstances, employment, retirement plans, sources of wealth, investment objectives, risk tolerance, investment preferences, wills and trust documents, insurance policies, service guidelines, and portfolio reporting requirements.

Financial information gathering should include the client's personal balance sheet, annual income and expenses, and sources of cash flows.

LOS 28.c

Taxes on individuals include income tax, wealth-based taxes, and consumption tax.

Tax-efficient strategies include legal tax avoidance, tax reduction, and tax deferral.

LOS 28.d

Planned goals are those that can be reasonably estimated within a specified time horizon.

Unplanned goals are related to unexpected financial expenditures.

Private wealth managers can assist their clients in quantifying, prioritizing, and reevaluating or changing goals.

LOS 28.e

Risk tolerance is dependent on both the willingness and ability to take risk.

Risk capacity is based on the ability to take financial risks and is a more objective measure of risk compared to risk tolerance.

Risk perception is a subjective measure of risk and is affected by the way risk questions are framed.

LOS 28.f

Technical skills include proficiency in financial planning; capital markets and asset classes; portfolio construction and monitoring; and technology skills.

Soft skills include communication, language, and social skills; education skills; and business development and sales skills.

LOS 28.g

Capital sufficiency analysis is used to determine the likelihood of clients being able to meet their objectives.

Deterministic forecasting assumes that a private client's portfolio will achieve a single compound annual growth rate across the investment horizon.

Monte Carlo simulation allows for real world uncertainty and determines the probability of success for a client's objective.

LOS 28.h

Saving for retirement usually begins at the early career stage and continues through the preretirement stage. Private clients depend on cash flows from pension income and their investment portfolio to fund their retirement. A key challenge in retirement planning is determining a sustainable rate at which distributions can be made from a client's portfolio for the rest of the client's lifetime.

A client's retirement goals can be analyzed using mortality tables, annuities, and Monte Carlo simulation. A life annuity can be used to reduce longevity risk. Monte Carlo simulation provides the probability of success for a client's retirement goals but does not consider shortfall magnitude.

Behavioral biases exhibited by retirees include increased loss aversion, consumption gaps, the annuity puzzle, and mental accounting.

LOS 28.i, 28.j, 28.k

Client Background and Investment Objectives

A client's background details are obtained from relevant personal, financial, and tax information.

Investment objectives may be planned, unplanned, ongoing, or a one-off. Multiple objectives should be prioritized into primary and secondary objectives.

Key Investment Parameters

Low risk tolerance is usually associated with high-priority goals and near-term goals.

Time horizon is described as a range (e.g., in excess of 15 years for a long horizon and less than 10 years for a short horizon). When a client has multiple objectives, there may be different time horizons for each objective.

Other investment parameters include asset class preferences, liquidity preferences (including a cash reserve), unique investment preferences, and constraints restricting investments for a client's portfolio.

Asset Allocation

Strategic asset allocation indicates a long-term target allocation for each asset class, with the portfolio being rebalanced periodically to maintain the target allocation.

Tactical asset allocation is an active management strategy that normally specifies a range for each asset class rather than a specific target allocation percentage.

Portfolio Management and Implementation

This covers wealth manager guidelines in relation to discretionary authority, portfolio rebalancing, tactical asset allocation changes, and acceptable investment vehicles that can be used to implement a client's investment strategy.

Wealth Manager Duties and Responsibilities

These include formulating and reviewing the client's IPS; constructing the portfolio; monitoring and rebalancing the portfolio; monitoring portfolio costs and third-party providers; and reporting portfolio performance.

IPS Appendix

This section includes modeled portfolio performance and capital market expectations.

LOS 28.l

The traditional approach to portfolio construction consists of identifying appropriate asset classes, developing capital market expectations, determining asset class weights, assessing constraints, implementing the portfolio, and choosing asset location.

Goals-based investing follows the same steps as the traditional approach but creates separate portfolios for each of the client's goals. This makes it easier for the client to specify risk tolerance as this is done for each specific goal.

LOS 28.m

Portfolio reports should include a performance summary for the current period; market commentary for the current period; portfolio asset allocation; detailed performance of asset classes and individual securities; benchmark report; historical performance of the client's investment portfolio; transaction details for the current period; purchase and sale report for the current period; and the impact of currency exposure and exchange rate fluctuations.

Portfolio reviews should cover the appropriateness of the client's existing goals and investment parameters; rebalancing of portfolio asset allocation to target allocation or ranges; any changes to the wealth manager's ongoing management of the portfolio; any changes or updates in the wealth manager's duties and responsibilities; and any changes to IPS and portfolio review frequency.

LOS 28.n

The success of an investment program should be evaluated in terms of goal achievement, process consistency, and portfolio performance. The investment program is successful only if it achieves success on all three criteria.

LOS 28.o

Ethical considerations include fiduciary duty and suitability, know your customer requirements, client confidentiality, and conflicts of interest.

Compliance considerations for private wealth managers vary by jurisdiction.

LOS 28.p

The mass affluent private client segment is characterized by a wide range of management services, larger client-to-wealth-manager ratio, and noncustomized portfolio management approach.

The HNW segment exhibits a smaller client-to-wealth-manager ratio, tailored investment solutions, and portfolios with sophisticated strategies and alternative investments.

The UHNW segment often has multigenerational investment horizons, complex tax and estate planning, and comprehensive service requirements that go beyond investment planning.

Robo-advisors are automated wealth management advisors that offer portfolio management services at a lower cost compared to traditional wealth managers. The scalable technology of robo-advisors allows them to service clients with small portfolios.

Module Quiz 28.1

1. **B**   Private clients are likely to have a wide range of investment objectives that may not be precisely defined, whereas institutional clients are more likely to have clearly defined objectives. Private clients are likely to have a less formal governance structure and a lower degree of investment sophistication compared to institutional clients. (LOS 28.a)

2. **A**   Bonds typically provide a regular income, meeting the private client's liquidity needs. Hedge funds and private equity often have a lock-up period, making these investments unsuitable for a private client with a short investment horizon and/or high liquidity needs. (LOS 28.a)

Module Quiz 28.2

1. McPherson has already established Gove's age, current employment, risk preference, interest in meeting several financial objectives, and low liquidity needs.

   McPherson should gather the following additional personal information about Gove's personal and investment background in order to prepare Gove's IPS (any five points from the following list would be acceptable):

   - Family circumstances, including marital status, and number and age of family members.
   - Proof of client identification (e.g., passport).
   - Future career aspirations.
   - Retirement plans.
   - Sources of wealth.
   - Specific return or investment objectives.
   - Unique investment preferences.
   - Further discussion of risk tolerance. (LOS 28.b)

2. Statement 1 is a tax avoidance strategy as the coupons and/or capital gains will not be taxed in the retirement account.

   Statement 2 is a tax reduction strategy because the new asset class recommended by the private wealth manager would attract lower taxes.

   Statement 3 is a tax deferral strategy. Since earnings accumulate tax free, taxes are deferred until withdrawals are made. (LOS 28.c)

3. **C**   Portfolio rebalancing and updating capital market expectations demonstrate Cheong's technical skills. Cheong displayed interpersonal and language skills when explaining her client's portfolio performance. (LOS 28.f)

Module Quiz 28.3

1. In relation to goal quantification, Collins has quantified her retirement spending requirements. Her financial advisor needs to assist her in quantifying her daughter's

college education expenses and the amount she would like to gift to her future grandchildren.

In relation to goal prioritization, even though Collins has stated that her highest priority goal is meeting her daughter's college expenses, the proximity of that goal should not be the sole factor determining its priority. Collins's financial advisor needs to assist her in prioritizing her financial goals and, if necessary, reevaluating her goals if the financial support of her daughter's college education and/or the desire to leave a gift to her grandchildren adversely impact her ability to fund her retirement lifestyle. (LOS 28.d)

2. Collins has a *higher* risk tolerance associated with her retirement goal. This is because she views retirement as a long-term goal and is willing to accept a 10%–15% drop in expected retirement spending. Since she expects to retire in 20 years, Collins is also likely to have a higher risk tolerance for the funding of unexpected health-related expenses.

   Collins is likely to have *lower* risk tolerance associated with her college fees goal. This is a near-term and her highest priority goal.

   Collins is likely to have *higher* risk tolerance associated with the goal of leaving a gift to her grandchildren at her death due to the long-term nature of this goal. (LOS 28.e)

Module Quiz 28.4

1. **C**   The simulation results show that the client has a 75% probability of having a portfolio value in excess of $2,116,646 in Year 25. Since the client's charitable donation is $2 million, the probability of success of meeting or exceeding that goal is slightly higher than 75%. (LOS 28.g)

Module Quiz 28.5

1. **C**   The probabilities from mortality tables are used to weight the expected annual cash flows of a retiree in order to estimate the present value of the retiree's retirement spending needs. (LOS 28.h)

2. **B**   A possible explanation for retirees preferring to spend investment income rather than liquidate securities is that retirees consider this a self-control mechanism. (LOS 28.h)

Module Quiz 28.6

1. **B**   The purchase of a holiday apartment is a financial goal and should be included in the *Investment Objectives* section of the IPS. Risk tolerance and asset class preferences are considered under *Investment Parameters*. (LOS 28.j)

2. **A**   ESG investing may require restrictions on investment in certain sectors or securities. These restrictions should be included as *Constraints* in the *Investment Parameters* section of an IPS. Time horizon and liquidity preferences are included as *Investment Parameters* in an IPS. (LOS 28.i)

3. **C**   Rebalancing methodology, discretionary authority, tactical asset allocation changes, and implementation are covered in the *Portfolio Management* section of a

client's IPS. Modeled portfolio behavior and capital market expectations are covered in the *IPS Appendix*. (LOS 28.i)

4. **A** A cash reserve and/or constraint on asset class selection because of liquidity needs is covered in the *Liquidity Preferences* section of an IPS. *Other Investment Preferences* might include a concentrated asset position. The *Portfolio Asset Allocation* section describes the asset allocation approach used for the client's portfolio (e.g., strategic or tactical asset allocation). (LOS 28.i)

5. **C** As each of Collins's financial goals has a different time horizon, Collins will have multiple time horizons. Time horizons should generally be expressed as a range because of the uncertainty associated with each goal (e.g., it is not possible to predict exactly how long Collins's retirement will last). (LOS 28.k)

Module Quiz 28.7

1. **B** Patel should recommend Alternative 2 as it correctly incorporates his client's preference for non-U.S. equities and alternative investments (as represented by commodities in this question) while staying within the portfolio volatility limit of 9%. Alternative 1 does not incorporate his client's preference for non-U.S. equities, while the portfolio volatility of Alternative 3 exceeds 9%. (LOS 28.l)

Module Quiz 28.8

1. Bond could provide the following additional items to improve the quality of his portfolio reports (any four points from the following list would be acceptable):
   - Market commentary for the current period to provide context for the portfolio's performance.
   - Historical performance of the client's portfolio since inception.
   - Transaction details for the current period showing contributions, withdrawals, interest, dividends, and capital appreciation.
   - Purchase and sale report for the current period.
   - Impact of currency exposure and exchange rate fluctuations.
   - Progress toward meeting goal portfolios when using a goals-based investing approach. (LOS 28.m)

2. **A** Tan's investment program has met the goal achievement criteria (her portfolio has matched the modeled return in Bond's capital sufficiency analysis and no meaningful changes are required to her investment strategy) and the process consistency criteria (guidelines were followed in relation to ongoing communications, rebalancing, etc.). However, the portfolio performance criteria has not been met because her portfolio has underperformed the benchmark's return over the period. A successful investment program is one that achieves success on *all* three criteria. (LOS 28.n)

Module Quiz 28.9

1. **A** Given that Bradescu appears to be very wealthy, Long will most likely want to satisfy KYC requirements (e.g., to fulfill anti-money laundering checks). (LOS 28.o)

2. **B** Characteristics of the UHNW segment include the provision of highly customized services (low client-to-manager ratio), including complex tax and estate planning.

Greater use of technology in providing wealth management services is a characteristic of the mass affluent segment. (LOS 28.p)

3. **A** Robo-advisors offer a cost advantage in the provision of wealth management services compared to traditional wealth management firms. Robo-advisors offer a primarily digital interface and typically implement investment strategies using mutual funds and ETFs. (LOS 28.p)

READING 29: TAXES AND PRIVATE WEALTH MANAGEMENT IN A GLOBAL CONTEXT[1]

Study Session 12

EXAM FOCUS

Any of the calculations in this topic assignment are testable on the exam. Understanding the terminology is also required. For example, what are TEA and TDA? You should be able to recognize when a given tax regime favors a particular investment strategy. In other words, what maximizes after-tax value under various tax rules? In addition to making calculations, there may be questions where the facts are sufficient to indicate what the best strategy will be even though insufficient details are provided to perform a calculation.

MODULE 29.1: APPROACHES TO TAXATION

LOS 29.a: Compare basic global taxation regimes as they relate to the taxation of dividend income, interest income, realized capital gains, and unrealized capital gains.

Video covering this content is available online.

CFA® Program Curriculum, Volume 5, page 240

There are three primary categories of taxes:

1. *Taxes on income:*
   - Paid by individuals, corporations, and other legal entities on various types of income including wages, interest, dividends, and capital gains.
2. *Wealth-based taxes:*
   - Paid on the value of assets held and on wealth transfers.
3. *Taxes on consumption:*
   - Sales taxes: Paid by the consumer.
   - Value-added taxes: Paid at each intermediate production step according to the amount of value added at the step; ultimately borne by the consumer (added into the purchase price).

Governments use taxes as a source of funding for operations and to encourage or discourage certain actions. For example, to encourage savings many governments provide favorable tax treatment on retirement accounts. Tax regimes are generally classified as flat or progressive. In a flat system the same tax rate is paid, regardless of the amount of income. In a progressive tax system the tax rate increases as the level of income increases. In 2009 in the United States, for example, single individuals pay 10% of income up to $8,350. On income above $8,350 up to $33,950, they pay at a rate of 15%.

The tax rate paid on the very last (highest) dollar of income is referred to as the *marginal tax rate*. A single (unmarried) taxpayer in the United States with a total taxable income of $20,000, for example, would have a marginal tax rate of 15% because that is the highest rate at which taxes are assessed. Using those rates, the individual's tax bill on $20,000 of taxable income is $(0.10)(\$8,350) + (0.15)(\$20,000 - \$8,350) = \$2,582.50$. The individual's *average tax rate* is $\$2,582.50 / \$20,000 = 0.1291 \cong 12.9\%$. In other words, had the individual paid taxes at a rate of 12.91% on all income earned, he would have paid $2,582.50.

EXAMPLE: Total taxes, marginal tax rate, and average tax rate

Assume ordinary income of $173,000. Tax rates in Figure 29.1 apply:

Figure 29.1: 2009 Tax Rates for a U.S. Individual Filing as a Single

Taxable Income		Bracket Amount (Col 2 – Col 1)	Tax Rate %	Plus
(1) Over	(2) Up to			
0	$8,350	$8,350	10	
$8,350	33,950	25,600	15	$835
33,950	82,250	48,300	25	4,675
82,250	171,550	89,300	28	16,750
171,550	372,950	201,400	33	41,754
372,950			35	108,216

Before we perform any calculations, let's discuss the "Plus" column in the table. That column saves you the trouble of calculating accumulated taxes at rates lower than the marginal rate. For example, according to the first tax bracket the individual pays 10% on income up to $8,350. If an individual has taxable income of exactly $8,350, she will pay $(0.10)(\$8,350) = \$835$. If the individual has income of $9,000, however, she will pay taxes at 10% on the first $8,350 and 15% on income between $8,350 and $9,000. The tax bill will be $(0.10)(\$8,350) + (0.15)(\$650) = \$932.50$. Notice that instead of calculating the taxes on the first $8,350, we could simply have calculated the taxes on the amount over $8,350 and added $835. Likewise, an individual with income falling in the highest tax bracket would pay $108,216 plus 35% on all income over $372,950.

Now let's return to the example.

1. **Calculate** the individual's *total tax bill*.

   The individual's taxable income (all taxed as ordinary income) is $173,000, so she falls in the second highest tax bracket. She will pay $41,754 plus 33% of all income above $171,550 and her tax bill will be:

   $\$41,754 + (0.33)(\$173,000 - \$171,550) = \$42,232.50$

   Let's calculate the tax bill the (without using the "Plus" column) by multiplying each successive amount of income by its respective tax rate:

   $$\begin{aligned} \text{taxes due} &= (0.10)(\$8,350) + (0.15)(\$25,600) + (0.25)(\$48,300) \\ &\quad + (0.28)(\$89,300) + (0.33)(\$173,000 - \$171,550) \\ &= \$835 + \$3,840 + \$12,075 + \$25,004 + \$478.50 \\ &= \underline{\$42,232.50} \end{aligned}$$

   Notice that we arrive at exactly the same number.* That's because the Plus column at each bracket sums up the total taxes due on all lower brackets. Because our individual fell in the second highest (fifth) tax bracket, the Plus column contained the taxes due on all income in the first four brackets (up to $171,550).

2. **Determine** the individual's *marginal tax rate*.

   The individual's marginal tax rate is simply the highest tax rate applied. In this case, that is 33%.

3. **Calculate** the individual's *average tax rate*.

The individual's average tax rate is calculated as total taxes paid divided by total taxable income and indicates the average rate paid on each dollar of taxable income.

$$\text{average tax rate} = \frac{\text{total taxes paid}}{\text{total taxable income}} = \frac{\$42{,}232.50}{\$173{,}000} = 0.244118 \cong 24.4\%$$

Check: 0.244118($173,000) = $42,232.50

* The typical tax table does not include column 3, which shows the total taxable income in each bracket. You would have had to calculate those numbers to determine taxes the "long way."

For the Exam: Consider these necessary warm-up calculations needed for later material. Be able to perform them.

In addition to imposing progressive tax rates on *ordinary income*,[2] many countries tax investment returns differently depending on whether they are in the form of interest, dividends, or capital gains. For example, interest and dividends might be taxed at a reduced rate or taxed at ordinary rates after they exceed some amount. Long-term capital gains are often taxed at a lower rate than short-term capital gains, with long-term definitions varying from one to five years or so. In most countries, capital gains taxes are paid only when capital gains are realized (i.e., when the investment is sold).

Figure 29.2 shows seven global tax regimes delineated by whether the ordinary income tax rate is progressive or flat and by the treatment of investment income (i.e., interest, dividends, and capital gains).

PROFESSOR'S NOTE

This table says almost nothing. It means sovereign governments may exact any combination of tax rules and approaches they wish. There is no limitation, and it is not restricted to seven combinations. Seven just illustrates some common combinations of features.

Figure 29.2: Seven Global Tax Regimes

Tax Regime	Ordinary Income Tax Structure	Favorable Treatment for Interest Income?	Favorable Treatment for Dividend Income?	Favorable Treatment for Capital Gains?
Common Progressive	Progressive	Yes*	Yes	Yes
Heavy Dividend Tax	Progressive	Yes*	No	Yes
Heavy Capital Gain Tax	Progressive	Yes*	Yes	No
Heavy Interest Tax	Progressive	No	Yes	Yes
Light Capital Gain Tax	Progressive	No	No	Yes
Flat and Light	Flat	Yes*	Yes	Yes
Flat and Heavy	Flat	Yes*	No	No

* Some countries may provide favorable tax treatment or exemption for some types of interest (e.g., tax-free bonds in the United States).

The first regime, **Common Progressive**, is the most frequent regime observed globally. There is, however, considerable variation in the special treatment of investment income, with some countries providing exemption for only part of investment income and other countries providing exemption for all investment income. The United States, United Kingdom, China,

France, Italy, Japan, and many other countries fall under this category. The **Light Capital Gain Tax** regime is the second most common regime, while only one country, Colombia, fell under the **Heavy Capital Gain Tax** regime.

Tax Regimes

LOS 29.b: Determine the effects of different types of taxes and tax regimes on future wealth accumulation.

LOS 29.c: Explain how investment return and investment horizon affect the tax impact associated with an investment.

CFA® Program Curriculum, Volume 5, page 243 and 246

The effect of taxes on investment returns is substantial. The effect will vary depending on the tax rate, the return on the investment, the frequency, and the form (regime) of taxation. Given the variety of tax methods, some form of consistent notation is necessary. In general, the following will apply in this reading:

- r: Pretax return.
- n: Number of time periods (years).
- t_i: Tax rate on income or interest.
- t_{cg} and t_w: Tax rates on capital gains and wealth, respectively.
- B: The basis, the ratio of cost basis to current market value where cost basis is not subject to capital gains tax at sale.
- p_i, p_d, p_{cg}: The portion (%) of return subject to interest, dividend, and capital gains tax in a time period.
- FVIF: Future value of an investment factor (e.g., the FV of an initial dollar invested at the end of time period *n*).
- AT and PT: After-tax and pretax, respectively.

> **PROFESSOR'S NOTE**
>
> Whether "i" refers to income in general or interest income in particular will depend on the context of the question. No one will try and trick you on that and there will be enough information to tell. You may see capital letters used occasionally instead of small cap (e.g., T*CG* for *tcg*); the meaning is the same, tax rate on capital gains.

> **MODULE QUIZ 29.1**
>
> *To best evaluate your performance, enter your quiz answers online.*
>
> 1. An individual pays taxes as a single tax payer. During the year her taxable income totaled $412,950. Applying the following rates, her tax bill and average tax rate are *closest* to:

Taxable Income		Bracket Amount	Tax Rate %	Plus
(1) Over	(2) Up to	(Col 2 – Col 1)		
0	$8,350	$8,350	10	
$8,350	33,950	25,600	15	$835
33,950	82,250	48,300	25	4,675
82,250	171,550	89,300	28	16,750

171,550	372,950	201,400	33	41,754
372,950			35	108,216

    A. $122,216; 30%.
    B. $136,274; 33%.
    C. $144,533; 35%.

2. Which of the following global tax regimes would *most likely* be beneficial to a very wealthy individual with substantial investment assets?
    A. The Flat and Heavy regime.
    B. The Common Progressive regime.
    C. The Light Capital Gain Tax regime.

3. An investor is evaluating various assets and strategies for her portfolio. Based solely on tax effects, **determine** which of the following investments would *most likely* be favored in a country with high tax rates on interest, dividends, and realized gains.
    A. Growth stocks with moderate turnover.
    B. Bonds with periodic payment of interest.
    C. Value stocks held for a moderate period of time.

MODULE 29.2: ACCRUAL AND DEFERRED CAPITAL GAINS TAXATION

Video covering this content is available online.

Accrual taxes are a periodic (usually annual) tax at a single tax rate on income or return. Most countries apply accrual taxation to dividends and interest. The future value of an investment after-tax under accrual taxation is:

$$FVIF_{AT} = [1 + r(1 - t_i)]^n$$

For accrual taxation $r(1 - t_i)$ is the after-tax rate of return so the computation is simply the after-tax value of a single initial currency unit invested. However, the ultimate effect of taxes on future value is complicated. One way to measure the effect is **tax drag**. Tax drag can be computed as both an amount and as a percentage. For example, for a U.S. investor:

tax drag$_\$$ = gain lost to taxes

= gain with no taxes – gain after taxes

= $FV_{PT} - FV_{AT}$

tax drag$_\%$ = % of gain lost to taxes

= tax drag$_\$$ / gain with no taxes

EXAMPLE: Account subject to annual accrual taxes

$1,000 is invested for 20 years at a pretax return of 10%. Return is subject to an annual tax rate of 30%. **Compute** the ending after-tax account value and the tax drag.

Answer:

$$FV_{AT} = \$1,000[1 + 0.10(1 - 0.30)]^{20} = \$3,869.68$$

This is a gain after tax of $3,869.68 – 1,000 = $2,869.68.

With no tax, the FV is $1,000(1 + 0.10)^{20} = $6,727.50 and the gain would have been:

For accrual taxes, it can be generalized that:

1. Over a time horizon of more than one period (n > 1), the tax drag percentage exceeds the tax rate because the periodic payment of taxes reduces the benefits of tax-free compounding over time. In the following illustration, the 37.5% tax drag exceeds the tax rate of 30%:

n =	10		FV	Gain	**Tax Drag**	
t =	**30%**	with tax:	$172.44	$72.44	$43.45	**37.5%**
r =	8%	no tax:	$215.89	$115.89		
PV =	100					

2. The adverse effects increase as the time horizon increases. Both the tax drag amount and percentage increase because the effects of lost pretax compounding increase. This is illustrated by increasing the time horizon from 10 to 20 years. Tax drag increases from $43.45 and 37.5% to $168.74 and 46.1%:

n =	20		FV	Gain	**Tax Drag**	
t =	30%	with tax:	$297.36	$197.36	**$168.74**	**46.1%**
r =	8%	no tax:	$466.10	$366.10		
PV =	100					

3. The adverse effects increase at higher rates of return as the dollar amount consumed by taxes is higher each year. Again this leads to a loss of pretax compounding. Both the tax drag amount and percentage increase. This is illustrated by increasing the return from 8% to 12% over a 10-year horizon. Tax drag increases from $43.45 and 37.5% to $86.56 and 41.1%:

n =	10		FV	Gain	**Tax Drag**	
t =	30%	with tax:	$224.02	$124.02	**$86.56**	**41.1%**
r =	**12%**	no tax:	$310.58	$210.58		
PV =	100					

4. The time horizon and level of return effects compounding, meaning tax drag is further increased when both time horizon and rates of return are longer and higher. This is illustrated by computing the drag over 20 years at a 12% return. This further increases the tax drag to $462.77 and 53.5%:

n =	20		FV	Gain	**Tax Drag**	
t =	30%	with tax:	$501.86	$401.86	**$462.77**	**53.5%**
r =	**12%**	no tax:	$964.63	$864.63		
PV =	100					

Deferred Capital Gains Taxation

Capital gains taxes are applied only to the gain in value on an asset. Generally, the timing of the tax can be controlled as it is only imposed when the asset is sold. By deferring the tax, the benefits of pretax compounding of return can be realized to lower the tax drag. If the initial starting value for the analysis period is the tax cost basis of the investment (i.e., the basis, B, equals 1.00), the future value of an investment after-tax under capital gains taxation is:

$$FVIF_{AT} = (1 + r)^n(1 - t_{cg}) + t_{cg}$$

The advantage of the formula is it can be adjusted for the tax implications of a basis other than 1.00 and the resulting additional tax issues. It becomes:

$$FVIF_{AT} = (1 + r)^n(1 - t_{cg}) + t_{cg}B$$

B = cost basis / asset value at start of period n

PROFESSOR'S NOTE

This formula may appear unfamiliar. The intuition is simple. Before the "+" sign, the after-tax value is computed as if both the gain and initial investment are taxed at the end of the analysis period. Because the initial cost basis is not taxed under capital gains taxation, the tax on that amount is added back (that is the final "+ $t_{cg}B$" term). You are probably used to computing the gain, the capital gains tax owed, and then the after-tax ending value, or some variation of that process. If your method matches the above formula, it is correct.

However, the formula approach simplifies the analysis of the basis. If the investment is purchased at the start of the analysis period, for example at $100, then the cost basis and the start of analysis value are both $100 and the basis is 100 / 100 = 1.00. However, suppose the investment had been made prior to the start of the analysis period for $90, then the basis is 90 / 100 = 0.90 and there is an unrealized gain that will be taxed at the end of the analysis. Or suppose the investment had been made prior to the start of the analysis period for $115. Then the basis is 115 / 100 = 1.15 and the gain from $115 will be taxed, not from $100. There are also some types of assets, such as real estate, where the basis may be adjusted over time.

EXAMPLE: Account subject to deferred capital gains taxation

Part 1: $1,000 is invested for 20 years at a pretax return of 10%. Return is subject to a deferred capital gains tax of 30%. **Compute** the ending after-tax account value and the tax drag. The cost basis is also $1,000 for B = 1.00.

Answer:

$$FV_{AT} = \$1,000[(1 + 0.10)^{20}(1 - 0.30) + 0.30(1.00)] = \$5,009.25$$

This is a gain after tax of $5,009.25 – 1,000 = $4,009.25.

With no tax, the FV is $1,000(1 + 0.10)^{20} = $6,727.50 and the gain would have been:

gain no tax: $6,727.50 - 1,000 = \$5,727.50$

gain lost to taxes: $5,727.50 - \$4,009.25 = \$1,718.25 = $ tag drag$_\$$
                    $\$1,718.25 / \$5,727.50 = 30.0\% = $ tax drag$_\%$

Part 2: **Compute** the ending after-tax account value and the tax drag if all other facts are the same except the cost basis is $800 or $1,200.

Answer:

If cost basis is $800, B = 800 / 1,000 = 0.80.

$$FV_{AT} = \$1,000[(1 + 0.10)^{20}(1 - 0.30) + 0.30(0.80)] = \$4,949.25$$

This is a gain after tax of $4,949.25 – 1,000 = $3,949.25.

With no tax, the FV and gain are still $6,727.50 and $5,727.50.

gain lost to taxes: $5,727.50 - $3,949.25 = $1,778.25 = \text{tag drag}_\$$

$$\$1,778.25 \;/\; \$5,727.50 = 31.0\% = \text{tax drag}_\%$$

Answer:

If cost basis is $1,200, B = 1,200 / 1,000 = 1.20.

$$\text{FV}_{AT} = \$1,000[(1 + 0.10)^{20}(1 - 0.30) + 0.30(1.20)] = \$5,069.25$$

This is a gain after tax of $5,069.25 – 1,000 = $4,069.25.

With no tax, the FV and gain are still $6,727.50 and $5,727.50.

gain lost to taxes: $5,727.50 - $4,069.25 = $1,658.25 = \text{tag drag}_\$$

$$\$1,658.25 \;/\; \$5,727.50 = 29.0\% = \text{tax drag}_\%$$

For capital gains taxes, it can be generalized that:

- Unlike accrual taxation, there is no lost compounding of return due to paying taxes periodically. All tax is paid at the end of the time horizon.
- The tax drag amount will increase as the time horizon and/or rate of return increase because the tax will be on a larger pretax ending value.
- The relationship of the tax drag percentage and stated tax rate will depend on the basis (B):
  - If there is no initial unrealized gain or loss and B equals 1.00, the tax drag percentage is equal to the tax rate.
  - If there is an initial unrealized gain and B is less than 1.00, the tax drag percentage is greater than the tax rate because there is an additional initial gain subject to tax.
  - If there is an initial unrealized loss and B is greater than 1.00, the tax drag percentage is less than the tax rate because the portion of the return earned during the period back to the cost basis is untaxed.

MODULE QUIZ 29.2

To best evaluate your performance, enter your quiz answers online.

1. An investment of $1,000 earns annual interest of 5% (no capital gains). Assuming accrual taxes of 30%, the expected after-tax value of the investment in 10 years is *closest* to:
   A. $1,035.
   B. $1,140.
   C. $1,411.

2. In Question 1, the tax drag in percentage terms is *closest* to:
   A. 1.6%.
   B. 34.7%.
   C. 53.2%.

3. An initial starting investment of $1,000 earns an annual return of 9%, all of which is deferred capital gains. Assume there is a capital gains tax rate of 20%, **determine** which of the following is *closest* to the after-tax value of the investment in 10 years.
   A. $1,894.
   B. $2,094.
   C. $2,367.

4. For Question 3, the tax drag in percentage terms is *closest* to:
   A. 20.0%.

B. 25.0%.

C. 34.6%.

5. An investment of $1,000 is expected to earn an annual return of 12% in fully deferred capital gains. If the capital gains tax rate is 20% and the cost basis is $800, **determine** which of the following is *closest* to the expected value of the investment in 10 years.

   A. $2,485.

   B. $2,645.

   C. $3,106.

6. Regarding an account subject only to annual accrual taxes, which of the following statements are correct?

   Statement 1: As the investment horizon *increases*, the tax drag *increases*.

   Statement 2: As the investment return *increases*, the tax drag *decreases*.

   A. Both of the statements are correct.

   B. Only statement 1 is correct.

   C. Only statement 2 is correct.

7. Regarding an account with a basis (B) of 1.0 that produces only fully tax-deferred capital gains, which of the following statements are correct?

   Statement 1: As the investment horizon increases, the tax drag percent is constant.

   Statement 2: As the investment return increases, the tax drag percent increases.

   A. Both of the statements are correct.

   B. Only statement 1 is correct.

   C. Only statement 2 is correct.

MODULE 29.3: ANNUAL WEALTH AND BLENDED TAXATION

Video covering this content is available online.

A **wealth tax** is imposed on total value, not just on return. For example, if a portfolio of GBP100 declines to GBP90 or increases to GBP 110, the tax would be imposed on GBP90 and GBP 110, respectively. Some countries impose annual wealth taxes on the value of real estate, often called a property tax. (Estate and gift taxes are another form of wealth tax but they are only imposed at death or time of the gift, not periodically).

The future value of an investment after-tax under wealth taxation is:

$$FVIF_{AT} = [(1 + r)(1 - t_w)]^n$$

Compared to the accrual tax formula ($FVIF_{AT} = [1 + r(1 - t_i)]^n$), the tax applies to end of period value $(1 + r)$ and not just to return (r) each period. For the same tax rate, the effect of a wealth tax is much larger than for the other forms of taxation because the wealth tax applies to both start of period value and return earned. As a result, wealth tax rates tend to be lower than accrual or capital gains tax rates. For example, suppose the wealth tax is 4% and the return is 3%. Over one period, the tax is 1,000(1.03)(0.04) = 41.20 and exceeds the return earned of 30.00. But if the return increases to 5%, the tax only increases to 1,000(1.05)(0.04) = 42.00 and is now less than the return of 50.00.

> **EXAMPLE: Account subject to annual wealth taxation**
>
> $1,000 is invested for 20 years at a pretax return of 10%. The investment is subject to an annual wealth tax of 3%. **Compute** the ending after-tax account value and the tax drag.
>
> **Answer:**

$$FV_{AT} = \$1,000[(1 + 0.10)(1 - 0.03)]^{20} = \$3,658.38$$

This is a gain after tax of $\$3,658.38 - 1,000 = \$2,658.38$.

With no tax, the FV and gain are still $\$6,727.50$ and $\$5,727.50$.

$$\text{gain lost to taxes:} \quad \$5,727.50 - \$2,658.38 = \$3,069.12 = \text{tag drag}_\$$$
$$\$3,069.12 \, / \, \$5,727.50 = 53.6\% = \text{tax drag}_\%$$

For an annual wealth tax, it can be generalized that:

1. Wealth taxes are more onerous than other taxes because they apply to total value, not just return. To illustrate using the previous examples for 20 years, 10% return, and B = 1.00:
   - The 30% accrual tax drags were $2,857.82 and 49.9%.
   - The 30% capital gains tax drags were $1,718.25 and 30%.
   - But for only a 3% annual wealth tax, they were $3,069.12 and 53.6%.

2. The adverse effects increase as the time horizon increases. Both the tax drag amount and percentage increase due to the loss of pretax compounding. This is illustrated by increasing the time horizon from 10 to 20 years:

n =	**10**		FV	Gain	**Tax Drag**	
t =	3%	with tax:	$191.27	$91.27	**$68.11**	42.7%
r =	10%	no tax:	$259.37	$159.37		
PV =	100					

n =	**20**		FV	Gain	**Tax Drag**	
t =	3%	with tax:	$365.84	$265.84	**$306.91**	53.6%
r =	10%	no tax:	$672.75	$572.75		
PV =	100					

3. But at higher rates of return the tax drag percentage declines even as the dollar amount increases. A large part of the tax is on the beginning value and is essentially "fixed" (i.e., not based on the return for the period). But tax drag percentage is related to gain and therefore tax drag percentage declines as the return increases. This is illustrated by increasing the return from 8% to 12% over a 10-year horizon.

n =	10		FV	Gain	**Tax Drag**	
t =	3%	with tax:	$159.20	$59.20	**$56.69**	48.9%
r =	**8%**	no tax:	$215.89	$115.89		
PV =	100					

n =	10		FV	Gain	**Tax Drag**	
t =	3%	with tax:	$229.03	$129.03	**$81.55**	38.7%
r =	**12%**	no tax:	$310.58	$210.58		
PV =	100					

4. The net result is that:
   - Tax drag amount increases with both longer time horizon and higher rate of return.
   - Tax drag percentage increases with longer time horizon but decreases with higher rate of return.

- Tax drag percentage is minimized at moderate time horizon and return. At combinations of either (1) a shorter time horizon and lower return or (2) a longer time horizon and higher return, the TD% can be higher. This is illustrated by comparing the three following scenarios.

n =	5		FV	Gain	Tax Drag	
t =	3%	with tax:	$109.60	$9.60	**$18.03**	**65.3%**
r =	**5%**	no tax:	$127.63	$27.63		
PV =	100					

n =	10		FV	Gain	Tax Drag	
t =	3%	with tax:	$191.27	$91.27	**$68.11**	**42.7%**
r =	**10%**	no tax:	$259.37	$159.37		
PV =	100					

n =	20		FV	Gain	Tax Drag	
t =	3%	with tax:	$890.00	$790.00	**$746.65**	**48.6%**
r =	**15%**	no tax:	$1,636.65	$1,536.65		
PV =	100					

Blended Taxation

Most portfolios are subject to multiple taxation methods and earn a portion (p) of the return from interest (i), dividends (d), and realized capital gains (rcg). In many cases, each portion is subject to a different tax rate. If all capital gains are realized and taxed each year, the three portions will sum to 100% and the annual tax rate is a weighted average of the component tax rates. But in many cases, the three will not sum to 100% as a portion of return is unrealized capital gain or loss (urcg) and the tax on that portion is deferred until sale. When there is a deferred tax portion, the annual tax rate computation will involve additional steps (but starting with the simple weighted average based on the realized tax portions).

EXAMPLE: Blended tax

An account was worth $100,000 at the beginning of the year and $110,000 at year-end. The client did not add or remove any funds (meaning all interest and dividends received remain in the account). The portfolio return includes $300 of interest taxed at 30%, $4,000 in dividends taxed at 20%, and $2,200 of realized gains taxed at 20%.

Calculate the total portfolio pretax return in amount and percentage. **Label** and **calculate** the four percentage portions of return that sum up to the total return. **Calculate** the weighted average realized tax rate for the year and the percentage return after realized taxes for the year. **Explain** how the last calculation overstates true return for the year.

Answers:

Pretax return is:

$$EV - BV = \$110,000 - 100,000 = \$10,000$$

Percentage return is: (EV / BV) – 1 = (EV – BV) / BV = 10,000 / 100,000 = 10%

- Interest portion is: $300 / 10,000 = 3\% = p_i$

- Dividend portion is: $4,000 / 10,000 = 40\% = p_d$

- Realized capital gain portion is: $2,200 / 10,000 = 22\% = p_{cg}$

- Unrealized capital gain portion must be:

$10,000 – 300 – 4,000 – 2,200 = \$3,500$ $\$3,500 / 10,000 = 35\% = p_{urcg} = 1 - 0.03 - 0.40 - 0.22$

> The weighted average realized tax rate (wartr) for the year is:
>
> $$\text{wartr} = p_i t_i + p_d t_d + p_{cg} t_{cg}$$
> $$= (0.03)(30\%) + (0.40)(20\%) + (0.22)(20\%) = 13.3\%$$
>
> The return after realized taxes for the year is:
>
> $$r^* = r\left[1 - \left(p_i t_i + p_d t_d + p_{cg} t_{cg}\right)\right] = r(1 - \text{wartr})$$
> $$= 10\%\{1 - [(0.03)(30\%) + (0.40)(20\%) + (0.22)(20\%)]\} = 8.67\%$$
> $$= 10\%(1 - 0.133) = 8.67\%$$
>
> The 8.67% overstates true after-tax return because there is an unrealized gain of $3,500 and a potential future tax liability to be paid on this gain.

The effect of the deferred capital gains on ultimate after-tax return is complex. The greater the portion of annual return that is taxed annually, the less the deferred taxes will matter as there is only a smaller portion of return to be subject to deferred taxes. But time horizon will also matter as the longer the holding period before the gain is realized, the greater the benefit of deferred tax compounding.

The net result can be projected in steps. (1) Begin with the after realized tax return (r*) based on the realized tax rate (wartr). (2) Then calculate an effective capital gains tax rate (T*) that reflects the capital gains rate that would apply to the deferred return. This T* reflects the effect of all taxes already paid on interest, dividends, and realized capital gains and that the stated CG tax rate only applies to a portion of the return. (3) Treat this effective capital gains tax rate (T*) as if it applied to 100% of the after realized tax return (which considers the taxes already paid). Lastly, and like the CG tax computation, this must be adjusted for any initial unrealized gain or loss [i.e., the basis (B)].

The process and its application are summarized using our previous blue box example. The additional required assumptions are a time horizon for deferral of eight years and an initial cost basis of $75,000 for the starting market value of $100,000, making B equal 0.75.

1. Based on the initial 10% pretax return and realized tax rate (wartr) of 13.3%, the after realized tax return (r*) was computed to be 8.67%.

2. In the example, 65% of return was taxed annually and 35% was subject to deferred capital gains tax. The effective capital gains tax rate T* is:

$$T^* = t_{cg}\left[\frac{1 - \left(p_i + p_d + p_{cg}\right)}{1 - \left(p_i t_i + p_d t_d + p_{cg} t_{cg}\right)}\right]$$

   This formula is the capital gains tax rate times the ratio of the portion of return subject to deferred taxes over one minus the realized tax rate:

$$T^* = t_{cg}\left[p_{\text{deferred cg}} \Big/ (1 - \text{wartr})\right] = 20\%\left[0.35 \Big/ (1-0.133)\right] = 0.0807$$

3. Then apply these to a modified version of the standard deferred capital gains FV formula:

   Standard formula: $\text{FVIF}_{AT} = (1 + r)^n(1 - t_{cg}) + t_{cg}B$

Modified formula:

$$FVIF_{AT} = (1 + r^*)^n(1 - T^*) + T^* - (1 - B)t_{cg}$$

$$= \$100,000\left[(1 + 0.0867)^8(1 - 0.0807) + 0.0807 - (1 - 0.75)(0.20)\right]$$

$$= \$100,000[(1.9448)(0.9193) + 0.0807 - 0.05] = \$181,855$$

🎓 PROFESSOR'S NOTE

Some candidates complain this process is complicated and not intuitive. That is a realistic assessment. One way to think of it is this: 1.9448 is the FV of an initial investment unit after the annual realized taxes are considered but before any deferred taxes. 0.9193 then treats this as if it is 100% taxed at the effective capital gains tax rate (T^*). The +0.0807 is an addback to reflect that some of the return was already taxed annually. –0.05 is a reduction in final result to reflect the effect of the initial unrealized gain and its tax liability.

📋 MODULE QUIZ 29.3

To best evaluate your performance, enter your quiz answers online.

1. An initial investment of $1,000 will earn an annual return of 14%. If the wealth-based tax is 3% and no other taxes are paid on the account, **determine** which of the following is *closest* to the value of the investment in 15 years.
    A. $4,520.
    B. $6,924.
    C. $7,138.

2. For Question 1, **determine** the approximate tax drag in percentage terms.
    A. 3.5%.
    B. 42.6%.
    C. 74.4%.

3. Regarding an account subject only to annual wealth taxes, which of the following statements are true?

    Statement 1: As the investment horizon increases → the tax drag $ increases.

    Statement 2: As the investment return increases → the tax drag % decreases.
    A. Both statements are correct.
    B. Only Statement 1 is correct.
    C. Only Statement 2 is correct.

4. A portfolio generates a total return of 15%. The tax rates on interest, dividends, and capital gains are 35%, 20%, and 20%, respectively. The proportions of the portfolio return from interest, dividends, and realized capital gains are 10%, 25%, and 35%, respectively. Using the data, the net return after all taxes is *closest* to:
    A. 11.25%.
    B. 11.50%.
    C. 12.68%.

5. In Question 4, the effective capital gains tax rate is *closest* to:
    A. 5.07%.
    B. 7.10%.
    C. 35.50%.

6. In Question 4, assume the return proportions continue for seven years and the account's cost basis is €100,000. The expected balance in the account in seven years after payment of all taxes is *closest* to:
    A. €184,260.
    B. €221,361.
    C. €224,013.

7. In Question 4, assume the account's basis is €80,000 instead of €100,000 and the investment's current value is €100,000. The expected balance in the account in seven years after payment of all taxes is *closest* to:
    A. €180,361.

B. €217,361.

C. €220,014.

COMPARING RESULTS: ACCRUAL EQUIVALENT RETURN AND TAX RATE

Accrual equivalent return (R_{AE}) can summarize the effects of any combination of tax rates and methods. It is the annualized single after-tax rate of return that, if compounded, would produce the same after-tax future value after considering all tax issues. Because the tax considerations are all reflected in the FV_{AT}, computing the R_{AE} is the same in any situation:

$$R_{AE} = (FV_{AT} / \text{initial investment})^{1/n} - 1$$

The accrual equivalent tax rate T_{AE} is the simple accrual taxation rate that if applied to the pre-tax return equates it to the R_{AE}. It is analogous to tax drag$_\%$ in that for a given situation, higher (or lower) tax drag$_\%$ will translate as higher (or lower) T_{AE}:

$$r (1 - T_{AE}) = R_{AE}$$

$$T_{AE} = 1 - (R_{AE} / r)$$

> **PROFESSOR'S NOTE**
>
> This section in the CFA curriculum on accrual equivalent returns and tax rates is marked as "optional," thus it will not be tested, but the concept does come up again in LOS 29.h, so it is an important concept to understand.

MODULE 29.4: TAX LOCATION

LOS 29.d: Discuss the tax profiles of different types of investment accounts and explain their effects on after-tax returns and future accumulations.

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Many countries offer accounts that allow funds to be deposited and invested in a tax-advantaged manner. There are generally specified limits on how much can be invested in these accounts and they are typically restricted to specified purposes such as retirement or health care. These accounts provide a tax advantage. No taxes are imposed on return while funds are in the account, allowing pretax compounding of returns. These accounts can generally be classified as:

- Tax-deferred accounts (TDA): Pretax funds are deposited. The investor can take a tax deduction for the amount contributed, reducing taxable income and taxes due. All tax is deferred until withdrawal, allowing tax deferred compounding. Because no tax was paid on the funds deposited, tax is due on the full amount of withdrawals. The tax rate will be the rate at the end of time *n* (t_n) and the after-tax future value will be:

    $$FVIF_{AT} = (1 + r)^n(1 - t_n)$$

- Tax-exempt accounts (TEA): Because after-tax funds are deposited, no tax is due on the returns earned or on withdrawals. Therefore, the after-tax future value does not explicitly depend on tax rate and is:

$$FVIF_{AT} = (1 + r)^n$$

In the absence of tax-preferred accounts or when the limits on contributions are reached, after-taxed savings are invested in taxable accounts where returns are subject to annual taxes. Taxable accounts provide no initial tax advantage or tax deferred compounding.

EXAMPLE: Accounts subject to different tax treatments

Assume that $100,000 is invested in each of four accounts:

1. An account taxed annually (accrual taxes; **FVIFAT**).
2. A tax-deferred account (**FVIFTDA**).
3. An account with deferred capital gains and an initial cost basis of $100,000 (**FVIFCGBT**).
4. A tax-exempt account (**FVIFTEA**).

Calculate the after-tax value of each account in 30 years, if each account earns 9% annually and all investment income and returns are taxed at 35%.

Answer:

1. **FVIFAT** $= [1 + r(1 - t_i)]^n$ $\Rightarrow \$100{,}000[1 + 0.09(1 - 0.35)]^{30}$
   $= \$550{,}460$

2. **FVIFTDA** $= (1 + r)^n(1 - t_n)$ $\Rightarrow \$100{,}000[(1 + 0.09)^{30}(1 - 0.35)]$
   $= \$862{,}399$

3. **FVIFCGBT** $= (1 + r)^n(1 - t_{cg}) + t_{cg}B$ $\Rightarrow \$100{,}000[(1 + 0.09)^{30}(1 - 0.35) + 0.35(1.0)]$
   $= \$897{,}399$

4. **FVIFTEA** $= (1 + r)^n$ $\Rightarrow \$100{,}000(1 + 0.09)^{30}$
   $= \$1{,}326{,}768$

It is not surprising the tax exempt account provides the highest wealth accumulation and fully taxable accrual taxation, the lowest. Both capital gains taxation and the tax-deferred account provide tax benefits and so rank in the middle of results. This implies that investors should locate assets in the type of account that provides greatest wealth accumulation and subject to the limits of how much can be located where.

Tax-Advantaged Accounts and Asset Allocations

It is common to examine an investor's asset allocation on a pretax basis. For example, consider an investor with €1,000,000 in assets, with €600,000 invested in equity in a TDA, and €400,000 invested in bonds in a TEA. Assume the investor's tax rate is 30%.

Traditional (pretax) analysis indicates 60% equity and 40% bonds—a 60/40 asset allocation. However, after-tax analysis may lead to a different conclusion.

The bond assets are in a TEA and purchased with after-tax funds. They are not subject to any future tax liability. The equity assets are in a TDA, were purchased with pretax funds, and are subject to a tax liability at 30% on withdrawal of €600,000 × (0.30) = €180,000. Their after-tax value is only €420,000 and the total portfolio after-tax value is only 420,000 + 400,000 = 820,000 for a 51.2/48.8 allocation. Further complicating the analysis, the allocation depends on the time horizon assumptions as the deferred tax due on the equity compounds over time.

Choosing Account Tax Type

Superficially, it appears the TEA is superior to the TDA because there is no tax due on withdrawals. However, this ignores that TEA contributions are made with after-tax funds and TDA with pretax funds. Suppose an investor has $100 pretax available for savings and is in a 30% tax bracket. The full $100 can be contributed to a TDA and invested. If that contribution is not made, the investor will owe $30 in taxes now and have available only $70 for contribution to the TEA. The valid future value comparison is:

TDA: $FV_{AT} = \$100(1 + r)^n(1 - t_n)$

TEA: $FV_{AT} = \$100(1 - t_0)(1 + r)^n$

The relevant difference and key consideration is whether the tax rate is lower now (t_0) or expected to be lower in the future (t_n).

- If t_0 is lower, pay the taxes now and use the TEA.
- If t_n is lower, pay the taxes in the future and use the TDA.
- If t_0 and t_n are the same, the accounts produce the same ending value.

EXAMPLE: Tax-deferred vs. tax-exempt accounts

An investor pays current and future taxes at 25% and is willing to give up $3,000 in consumption. The investor can contribute $3,000 in after-tax dollars to a tax-exempt account or $4,000 to a tax-deferred account.

🎓 **PROFESSOR'S NOTE**

At a tax rate of 25%, the investor will have to earn $4,000 and pay taxes of $1,000 to contribute $3,000 to a tax-exempt account. Alternatively, the investor can deposit the entire $4,000 into a tax-deferred account.

Assuming pretax income of $4,000 is available to be saved and earns an investment return of 8% for 20 years and the tax rate is 25%, **calculate** the future values of the following three account structures:

1. A TDA (e.g., retirement account).
2. A TEA (e.g., tax-exempt bonds).
3. An account taxed annually (e.g., savings account).

Answer:

The corresponding formulas and future value calculations, considering after-tax contributions:

1. $FV_{TDA} = (1 + r)^n(1 - t_n)$ ⇒ $\$4,000[(1 + 0.08)^{20}(1 - 0.25)] =$ **$13,983**

2. $FV_{TEA} = (1 + r)^n$ ⇒ $\$3,000(1 + 0.08)^{20} =$ **$13,983**

3. $FV_{AT} = [1 + r(1 - t_i)]^n$ ⇒ $\$3,000[1 + 0.08(1 - 0.25)]^{20} =$ **$9,621**

EXAMPLE: Unequal current and future tax rates

Assume the investor in the previous example pays current taxes at 25% and expects a future tax rate of 20%. **Determine** whether the TDA or TEA will have the greater future value.

Answer:

In this case, the investor faces a lower future tax rate. The investor's current situation is unchanged. She will still have to earn $4,000 to invest $3,000 in the tax-exempt account or be able to invest the entire $4,000 in the tax-deferred account:

Equal Limits on Contributions (A Special Case)

Contribution amounts are normally stated as a nominal amount and may be the same for both TDAs and TEAs. If the investor has additional disposable (not needed for other purposes) funds that can be contributed, the TEA can (in this situation) be superior for maximizing future wealth even if the current and future tax rates are equal.

Returning to the previous example, where current and future tax rates were 25% and the pretax rate of return was 8% (giving an after-tax rate of return of 6%), a $4,000 pretax deposit into a TDA and a $3,000 after-tax deposit into a TEA had the same value at the end of the 20-year period of $13,983.

Now suppose regulations limit the contribution to either account to $3,000 (this will be in pretax terms for a TDA and in after-tax terms for a TEA) and assume, once again, that the investor has $4,000 (pretax) that she is prepared to divert away from current consumption.

If she chooses the TEA, then all of the $4,000 will be taxed; this means $1,000 will be paid in tax, leaving $3,000 for the TEA (exactly equaling the limit on contributions). As we saw previously, this will grow to $13,983 over 20 years.

If, instead, she chooses the TDA, then only $3,000 of the $4,000 can be invested, due to the contribution limit, and this will grow over the 20 years to $3,000 \times 1.08^{20} \times (1 - 0.25) = $10,487$. The $1,000 that is not put into the TDA will be subject to tax, leaving $750, which we can assume will be invested in a taxable account earning 6% net after-tax per year, compounding over the 20 years to $750 \times 1.06^{20} = $2,405$. In total, the TDA and the taxable residue will have a value of $10,487 + $2,405 = $12,892$ at the end of the 20 years.

The TEA is the superior choice, even though current and future tax rates are the same, because the limit on contributions is, in effect, more generous for the TEA (where the limit applies to the after-tax value) than for the TDA (where the limit applies to the pretax value).

MODULE QUIZ 29.4

To best evaluate your performance, enter your quiz answers online.

1. Assume €100,000 is invested in a tax-deferred account. The expected after-tax balance that can be withdrawn after 20 years, assuming a tax rate of 30% and a pretax return of 10%, is *closest* to:
   - A. €386,968.
   - B. €470,925.
   - C. €672,750.

2. Assume €100,000 is invested in a tax-exempt account. The expected balance in the account after 20 years, assuming a tax rate of 30% and pretax return of 10%, is *closest* to:
   - A. €386,968.
   - B. €500,925.
   - C. €672,750.

3. An investor has €800,000 equity in a tax-deferred account and €600,000 in bonds in a tax-exempt account. Assuming a tax rate of 40%, the after-tax asset allocation is *closest* to:

    A. 44.4% stocks; 55.6% bonds.
    B. 57.1% stocks; 42.9% bonds.
    C. 31.0% stocks; 69.0% bonds.

4. An investor pays 20% current taxes but will pay future taxes at 30%. The investor is willing to give up $2,000 in current consumption and expects to earn 12% in a tax-advantaged account for 30 years. Assuming no contribution limits, **determine** which account will have the highest future after-tax accumulation.
    A. A tax-deferred account.
    B. A tax-exempt account.
    C. The accounts provide the same future accumulations.

5. Which of the following assets would be the *most appropriate* asset to locate in a tax-deferred account rather than a taxable account?
    A. Tax-exempt bonds.
    B. High-growth stocks.
    C. Corporate bonds.

MODULE 29.5: AFTER-TAX RETURN AND RISK

LOS 29.e: Explain how taxes affect investment risk.

CFA® Program Curriculum, Volume 5, page 264

Taxes reduce return, which means they also reduce the variability of return and the after-tax risk of the investment. Suppose pretax return on an investment can be either +10% or –10% and the investor's tax rate is 40%. Then the after-tax returns can be either +6% or –6%. The +6% is obviously 10%(1 – 0.40) and –6% is –10%(1 – 0.40). The reasoning for –6% is that the pretax loss can be used to reduce otherwise taxable income from other sources (i.e., the government shares in the upside and downside of the investment). The after-tax standard deviation of the + to – 6% returns must be lower than the pretax standard deviation of the + to – 10%. After-tax return and risk are calculated as:

$$r_{AT} = r(1 - t)$$

$$\sigma_{AT} = \sigma(1 - t)$$

EXAMPLE: Risk reduction

Suppose an investor has half her portfolio in stocks and half in bonds. No tax deferred accounts are available. The returns on the stock investment are taxed at an annual rate of 20% and the bond returns are taxed at a rate of 30%. The pretax standard deviation of stock returns is 16% and the pretax standard deviation of bond returns is 6%.

Calculate the pretax and after-tax standard deviations of portfolio returns, assuming the correlation between stocks and bonds is 1.

Answer:

If the correlation between stocks and bonds is 1, the **pretax standard deviation** of portfolio returns is a simple weighted average of the individual standard deviations:

    $\sigma_{P,\text{before-tax}} = 0.5(16\%) + 0.5(6\%) = 11.0\%$

After-tax standard deviation is:

    $\sigma_{P,\text{after-tax}} = 0.5(16\%)(1 - 0.2) + 0.5(6\%)(1 - 0.3) = 8.5\%$

> **EXAMPLE: Risk reduction with accrual and deferred taxes**
>
> Now assume the bonds are held in a tax-exempt account. **Calculate** the after-tax standard deviation of portfolio returns.
>
> **Answer:**
>
> $$\sigma_{P,\text{after-tax}} = 0.5(16\%)(1 - 0.2) + 0.5(6\%) = 9.4\%$$

In this case, the standard deviation of portfolio returns increases from 8.5% when the returns are fully taxable, to 9.4%. The increase in variability is because the government does not absorb part of the variability of the bond returns. Because the stock returns are taxed annually, however, there is still an amount of risk reduction.

Generating Tax Alpha

The account type where assets are held (i.e., the asset location) is important for tax management. From strictly a tax-management standpoint, an investor should locate assets that would be heavily taxed in tax-advantaged accounts and hold more lightly taxed assets in taxable accounts. More lightly taxed can refer to either lower tax rates and/or tax deferral. The value created by this effective tax management of investments is referred to as **tax alpha**.

Assuming there are limits on how much can be placed in the tax-deferred locations, this generally favors holding bonds in tax-deferred accounts because the bonds produce most of their return from income. In contrast, equities can be held in the taxable accounts. The equity return is typically made up mostly of capital gains rather than dividend income and capital gains can be deferred. By extending the holding period, the T_{AE} can be reduced even in the fully taxable location to improve the equity after-tax return and generate tax alpha.

In more complicated situations, both tax location and asset allocation can be optimized by using leverage. Suppose an investor has $75,000 in tax-deferred accounts (either TDA or TEA) all invested in bonds and $25,000 in equities in fully taxable accounts to maximize tax alpha. However, the 25/75 equity/bond allocation is not optimal and 60/40 is the desired allocation. There are two possibilities:

1. Shift $35,000 of the tax-deferred account holdings from bond to equity to produce the 60/40 allocation. However, this will reduce tax alpha even though it increases expected return with a shift to higher return equity.

2. Or borrow and invest in the taxable account the desired amount of increased equity holdings ($35,000). Borrowing is the equivalent of shorting bonds, [i.e., you pay interest on the borrowings (a short position) while you receive interest on bonds owned (a long position)]. This optimizes tax alpha and produces the desired allocation.

Location	Asset Class	Before Leverage		After Leverage	
		Market Value	% Allocation	Market Value	% Allocation
TDA or TEA	Bond	$75,000	75%	$75,000	75%*
Taxable	Equity	$25,000	25%	$60,000	60%
	Short Bond			–$35,000	–35%*
Total		$100,000	100%	$100,000	100%

* The net bond allocation is now 75 – 35 = 40%.

LOS 29.f: Discuss the relation between after-tax returns and different types of investor trading behavior.

CFA® Program Curriculum, Volume 5, page 268

Generally, the more frequent the trading, the less the ability to defer taxes, increasing tax drag and decreasing after-tax return. Trading behavior can be differentiated as:

1. **Traders**—due to frequent trading, all gains are realized frequently and taxed at a generally higher rate with no deferred tax compounding. Tax alpha is lost.
2. **Active investors**—trade less frequently than traders so that many of their gains are longer term and taxed at lower rates.
3. **Passive investors**—buy and hold equity so that gains are deferred to benefit from pretax compounding and are taxed at lower long-term rates.
4. **Exempt investors**—avoid taxation altogether.

> **EXAMPLE: The effects of trading behavior on taxes**
>
> Consider the case of four equity traders who invest $1,000 for 30 years and earn 9% annually. They pay a tax of 30% on gains realized in less than a year and a tax of 20% on gains held a year or longer. What are the future accumulations for each trader?
>
> **Answer:**
>
> Trader—realizes all gains as short term and pays 30% tax annually:
>
> $$\text{FVIF}_{AT} = [1 + r(1 - t_i)]^n : \$1,000[1 + 0.09(1 - 0.30)]^{30} = \$6,252$$
>
> Active investor—simplify by assuming realizes all gains as long term and pays 20% tax annually:
>
> $$\text{FVIF}_{AT} = [1 + r(1 - t_i)]^n : \$1,000[1 + 0.09(1 - 0.20)]^{30} = \$8,051$$
>
> Passive investor—defers all gains until the end of the investment horizon and pays a 20% tax at that time:
>
> $$\text{FVIF}_{cgt} = (1 + r)^n (1 - t_{cg}) + t_{cg} : \$1,000[(1 + 0.09)^{30} (1 - 0.20) + 0.20] = \$10,814$$
>
> Exempt investor—does not pay taxes:
>
> $$\text{FVIF}_{TEA} = (1 + r)^n : \$1,000(1 + 0.09)^{30} = \$13,268$$

PROFESSOR'S NOTE

You should conclude that:

- Asset allocation is more important than asset location.
- Borrowing to optimize both tax alpha and asset allocation is an unusual strategy.
- More frequent trading, even if it increases pretax return, may reduce after-tax return when the additional tax burden is considered (i.e., + pretax alpha may not generate + after-tax alpha).
- Once an appropriate asset allocation is achieved, then it is appropriate to utilize legal methods to maximize after-tax value.

MODULE QUIZ 29.5

To best evaluate your performance, enter your quiz answers online.

1. All else equal, which of the following will usually have the lowest risk?
    A. A tax-deferred account.
    B. A taxable account.
    C. A tax-exempt account.

2. All else equal, which of the following investors would have the lowest future accumulation?
    A. A trader.
    B. An active investor.
    C. A passive investor.

MODULE 29.6: MORE TAX ALPHA STRATEGIES ▶

LOS 29.g: Explain tax loss harvesting and highest-in/first-out (HIFO) tax lot accounting.

CFA® Program Curriculum, Volume 5, page 269

Tax Loss Harvesting

Tax loss harvesting refers to realizing losses to offset realized gains or other taxable income. It reduces the taxes due now but generally does not reduce eventual total taxes. If the benefit is taken now to lower taxes now, it cannot be used in the future and taxes in the future will be higher. Even so, tax loss harvesting is beneficial. Think of it as saving $100 in taxes now versus paying $100 at a future date.

> **EXAMPLE: Tax loss harvesting**
>
> An investor has a realized capital gain of $100,000 and pays a capital gains tax rate of 20%. The investor is considering selling Stock A to reduce his tax bill. Stock A has a cost basis of $120,000 and has fallen to a current market value of $80,000.
>
> **Calculate** the investor's tax payment if Stock A is not sold, if it is sold, and the difference in tax payments this year.
>
> **Answer:**
>
> *If Stock A is not sold,* the investor will have to pay capital gains taxes on the full $100,000 capital gain: $0.20 \times \$100,000 = \$20,000$.
>
> *If Stock A is sold,* there is a capital loss: $\$80,000 - \$120,000 = -\$40,000$. This $40,000 loss can be applied against the $100,000 gain such that the net taxable gain is only $60,000. The tax bill is $0.20 \times \$60,000 = \$12,000$, so the tax savings is $\$20,000 - \$12,000 = \$8,000$.
>
> The tax loss harvesting saves $8,000 in tax payments this year.

> **For the Exam:** In a simple case like this, the immediate tax savings from the loss harvest can be calculated directly as the capital loss multiplied by the tax rate: $\$40,000 \times 0.20 = \$8,000$. This is the most likely question.
>
> In practice, taxing authorities have many different ways of treating tax loss harvesting. In many cases, there are restrictions on loss harvesting. On the exam, always read the question and apply the case facts as given.

When a tax loss is harvested, the proceeds are typically reinvested, and the reinvested sale proceeds become a new lower cost basis. When the new asset is eventually sold, there is a higher realized gain (or lower loss) for higher tax due (or less tax sheltering) in the future. Taking the loss now means that loss amount is unavailable in the future.

Highest-In/First-Out (HIFO) Tax Lot Accounting

Most tax authorities allow a form of specific inventory accounting. When an investor makes a partial sale and has acquired the stock on different dates, each at different cost basis, the investor can select which tax lots are applied to the sale. In that case, the tax lots that produce the lowest tax bill should be designated as sold. Consider an investor who bought 100 shares of stock on three different dates for $10,000, $12,000, and $15,000. The investor just sold 100 shares.

Highest-in/first-out (HIFO) is generally optimal and the 100 shares with a cost basis of $15,000 should be designated as sold. If the sale price is higher than $15,000, this will minimize the gain and capital gains tax due now. If the sale price is less than $15,000, this will maximize the realized loss and immediate tax benefits.

In a special case where future tax rates are expected to be higher than current tax rates, **lowest-in/first-out (LIFO)** may be better and the 100 shares with a cost basis of $10,000 should be designated as sold. It will create a higher immediate tax bill. But it defers the

higher tax lots for sale in the future. That will lower the realized gain or increase the realized loss at a future date and higher tax rates. In other words, it will reduce the realized gain or maximize the loss until a period of higher rates and greater tax benefit.

Holding Period Management

Many tax authorities impose a higher capital gains tax rate on shorter-term versus longer-term holdings. While it is generally desirable to extend the holding period to defer the tax, it is particularly desirable to extend the holding period when it also lowers the tax rate.

> **EXAMPLE: Expected returns, tax classifications, and after-tax returns**
>
> Investor 1 is an extremely active trader whose returns are always taxed at the ordinary tax rate of 40%. Investor 2 follows a minimum trading strategy, only recognizing long-term capital gains taxes of 20% each year. Both recognize gains and pay taxes annually. Both investors earn a pretax return of 12%. **Determine** the after-tax value of a $1.00 over a 1-year and 10-year holding period for both investors and the value ratio of the two investors.
>
> **Answer:**
>
> Over 1-year holding period:
>
> Investor 1: after-tax annual return = {1 + [0.12(1 − 0.40)]} × $1.00 = $1.072
>
> Investor 2: after-tax annual return = {1 + [0.12(1 − 0.20)]} × $1.00 = $1.096
>
> A ratio favoring the patient trader (Investor 2) of 1.096 / 1.072 = 1.022
>
> Over 10-year holding period:
>
> Investor 1: after-tax annual return = $\{1 + [0.12(1 − 0.40)]\}^{10}$ × $1.00 = $2.004
>
> Investor 2: after-tax annual return = $\{1 + [0.12(1 − 0.20)]\}^{10}$ × $1.00 = $2.501
>
> A ratio favoring the patient trader (Investor 2) of 2.501 / 2.004 = 1.247
>
> The advantage is growing with longer time periods.

The implications of a higher short-term versus lower long-term gains taxation rate are:

- The ratios of ending after-tax value of the patient and rapid trader (1.022 and 1.247 over 1- and 10-year investment horizons) increase in favor of the patient trader:
    - At higher rates of return (e.g., 2% versus 4%).
    - Over longer investment horizons (e.g., five years versus ten years).
- Rapid trading would require a much higher pretax return to break even on an after-tax basis. In the example, the active trader would have to earn 16% per year pretax to stay even with the more patient investor earning 12% pretax. The 16% is a 33% higher pretax return. Calculations to support this conclusion are shown below:

  > Rapid trader, t = 40%; 16% (1 − 0.40) = 9.6% after-tax
  > Patient trader, t = 20%; 12% (1 − 0.20) = 9.6% after-tax

Another dimension of holding period management is the timing of sales in relation to tax year end. If a sale is being considered near the tax year end, make the sale:

- Before year end if it is a loss in order to place the loss in the current tax year and offset gains this year. This will lower taxes this year but raise taxes next year.
- After year end if it is a gain. This will defer the gain and tax until next year's tax return.

If tax rates are going to change, the analysis could become more complicated. If, for example, tax rates will rise next year, it may become more advantageous to incur the gain now, at the lower rate, than wait.

TAXES AND MEAN-VARIANCE OPTIMIZATION

LOS 29.h: Demonstrate how taxes and asset location relate to mean–variance optimization.

CFA® Program Curriculum, Volume 5, page 274

In the previous sections, we discussed how taxes affect the after-tax returns and risk of investments. Ideally then, the efficient frontier of portfolios should be viewed on an after-tax basis. Furthermore, because the tax status of an investment depends on the type of account it is in (i.e., its asset location), the same asset could appear on the efficient frontier in both taxable and non-taxable forms.

For example, an investor holds stocks and bonds in taxable, tax-deferred, and tax-exempt accounts. In this case, there are effectively six different assets to consider. Of course, the optimization process would have to be constrained to account for limits on the amount of funds that can be placed in tax-advantaged accounts and the type of assets that can be allocated to them.

The mean-variance optimization should optimally allocate assets and determine the optimal asset location for each asset. Accrual equivalent after-tax returns would be substituted for before-tax returns, and risk on an after-tax basis would be substituted for before-tax risk.

MODULE QUIZ 29.6

To best evaluate your performance, enter your quiz answers online.

1. An investor has a realized capital gain of £80,000 and pays a capital gains tax rate of 30%. The investor can sell another stock with a cost basis of £140,000 and a current market value of £90,000. The tax savings (tax alpha) from harvesting the loss is *closest* to:
   A. £9,000.
   B. £10,000.
   C. £15,000.

2. In the previous question, assume the investor can either:

   Strategy 1: Sell the stock now and recognize the loss in the current year.

   Strategy 2: Hold the stock and sell it at the end of the second year.

   In either case, the old or new stock is sold at the end of the second year after earning a 10% return for that year. Any current tax savings (tax alpha) is immediately reinvested in very similar stock. **Determine** which of the strategies provides the highest future accumulation.
   A. Strategy 1.
   B. Strategy 2.
   C. The strategies provide the same future after-tax accumulation.

3. To perform mean-variance optimization from the perspective of a specific taxable investor, use:
   A. accrual equivalent after-tax returns and after-tax standard deviations.
   B. accrual equivalent after-tax returns and before-tax standard deviations.
   C. annual pretax returns and after-tax standard deviations.

KEY CONCEPTS

LOS 29.a

The tax rules of countries vary. Some combinations of rules include the following:

Tax Regime	Ordinary Income Tax Structure	Favorable Treatment for Interest Income?	Favorable Treatment for Dividend Income?	Favorable Treatment for Capital Gains?
Common Progressive	Progressive	Yes*	Yes	Yes
Heavy Dividend Tax	Progressive	Yes*	No	Yes
Heavy Capital Gain Tax	Progressive	Yes*	Yes	No
Heavy Interest Tax	Progressive	No	Yes	Yes
Light Capital Gain Tax	Progressive	No	No	Yes
Flat and Light	Flat	Yes*	Yes	Yes
Flat and Heavy	Flat	Yes*	No	No

* Some countries may provide favorable tax treatment or exemption for some types of interest (e.g., tax-free bonds in the United States).

LOS 29.b

annual accrual taxation: $FVIF_{AT} = [1 + r(1 - t_i)]^n$

deferred capital gains taxation: $FVIF_{AT} = (1 + r)^n(1 - t_{cg}) + t_{cg}B$

B = cost basis / asset value at start of period n

annual wealth taxation: $FVIF_{AT} = [(1 + r)(1 - t_w)]^n$

blended taxation:

weighted annual realized tax rate: $wartr = p_i t_i + p_d t_d + p_{cg} t_{cg}$

return after realized taxes: $r^* = r[1 - (p_i t_i + p_d t_d + p_{cg} t_{cg})] = r(1 - wartr)$

effective capital gains tax rate: $T^* = t_{cg}[p_{deferred\ cg} / (1 - wartr)]$

future value of the investment: $FVIF_{AT} = (1 + r^*)^n(1 - T^*) + T^* - (1 - B)t_{cg}$

Accrual equivalent after-tax return (R_{AE}) is the annual return that produces the same terminal value as the taxable portfolio:

$R_{AE} = (FV_{AT} / \text{initial investment})^{1/n} - 1$

Accrual equivalent tax rate (T_{AE}) is the tax rate that makes the pretax return (R) equal to the accrual equivalent after-tax return (R_{AE}):

$T_{AE} = 1 - (R_{AE} / r)$

LOS 29.c

For accrual taxes:

- If n > 1, tax drag percentage > t.
- As *n* and/or *r* increase, tax drag percentage and amount increase.

For deferred capital gains taxes:

- As *n* and/or *r* increase, tax drag amount increases.
  - If B = 1.0, tax drag percentage = t.
  - If B < 1.0, tax drag percentage > t.
  - If B > 1.0, tax drag percentage < t.

For annual wealth taxes:

- Tax effects are more onerous as the tax rate applies to total value, not just return.
- As *n* increases, tax drag percentage and amount increase.
- But as *r* increases, tax drag percentage decreases even as amount increases.
- Tax drag percentage is lower at moderate time horizon and return.

LOS 29.d

Both TDA and TEA provide tax deferred compounding of return.

Tax-deferred account (TDA) contributions provide a front-end tax advantage; contributions are pretax, but all withdrawals are taxed.

$$FVIF_{AT} = (1 + r)^n(1 - t_n)$$

Tax-exempt account (TEA) contributions provide a back-end tax advantage; contributions are after-tax, and withdrawals are not taxed.

- If the current and the expected future tax rate are equal, TDA and TEA provide equal future value.
- If the future tax rate is expected to be lower, use the TDA.
- If the future tax rate is expected to be higher, use the TEA.

LOS 29.e

After-tax return is less variable than pretax return as taxes take a portion of the upside and reduce the downside.

$$r_{AT} = r(1 - t)$$

$$\sigma_{AT} = \sigma(1 - t)$$

LOS 29.f

High turnover lowers tax alpha as the benefits of tax-deferred compounding are lost. In addition, more gains are taxed at higher short-term rather than lower long-term rates.

In order from lowest tax alpha (highest turnover) to highest tax alpha (lowest turnover) are: traders, active investors, and passive investors. Exempt investors do not pay taxes.

LOS 29.g

Tax loss harvesting uses investment losses to offset investment gains or income, resulting in a tax savings. This initial tax savings is overstated because the tax savings is taken now and the low cost basis is not available in the future. Harvesting is a deferral of taxes.

Investors often accumulate a security position through a series of trades, each occurring at different points in time and at different prices. If a partial sale of the position is being made, it is generally best to designate the highest cost basis lot as being sold first (HIFO) to minimize the tax gain or maximize the tax loss. If future tax rates are expected to be higher than current rates, designating the lowest cost basis as being sold (LIFO) may be better as it accelerates tax payments to the present and lowers them in the future.

LOS 29.h

Ideally, the efficient frontier of portfolios should be viewed on an after-tax basis. For example, an investor holds both stocks and bonds in both taxable and tax-exempt accounts. In this case, there are four different assets that could appear on the efficient frontier. Of course, the optimization process would have to be constrained to account for limits on the amount of funds that can be placed in tax-advantaged accounts and the type of assets that can be allocated to them.

The mean-variance optimization should optimally allocate assets and determine the optimal asset location for each asset.

ANSWER KEY FOR MODULE QUIZZES

Module Quiz 29.1

1. **A**   With total taxable income of $412,950, the individual falls in the highest tax bracket (*marginal tax rate* = 35%). As such, she pays $108,216 plus 35% of any amount above $372,950. Her total tax bill is:

   $108,216 + ($412,950 − $372,950)(0.35) = $122,216

   Her average tax rate is the average rate paid on her entire taxable income, which is determined by dividing taxes paid by taxable income:

   $\frac{\$122,216}{\$412,950} = 29.6\%$

   (LOS 29.a)

2. **B**   A very wealthy individual is presumed to have a lot of assets generating interest, dividends, and capital gains. A Flat and Heavy regime would mean they pay high tax rates on dividend income and capital gains. A Light Capital Gains regime would give favorable tax treatment for capital gains but not interest and dividends. Common Progressive would give favorable tax relief on interest, dividends, and capital gains. (LOS 29.a)

3. **A**   Some of the gain will be deferred each year and such stocks pay low dividends. Bonds and value stocks will pay more of their return in the more heavily taxed interest and dividends. (LOS 29.a)

Module Quiz 29.2

1. **C**   Expected future value after paying annual (accrual) taxes:
   $$\text{FV}_{IT} = \text{V}_P[1 + r\,(1 - t_i)]^n$$
   $$= \$1,000[1 + 0.05\,(1 - 0.30)]^{10}$$
   $$= \$1,410.60$$

   (LOS 29.b, 29.c)

2. **B**   If the tax rate were zero in the previous question, the expected value of the investment would have been:
   $$\text{FV}_{IT} = \text{V}_P[1 + r\,(1 - t_i)]^n$$
   $$= \$1,000[1 + 0.05\,(1 - 0)]^{10}$$
   $$= \$1,628.89$$

   The effect of taxes is a reduction of investment value of $218.29 (= $1,628.89 − $1,410.60). On a percentage basis, the tax drag is 34.7% [= $218.29 / ($1,628.89 − $1,000)]. (LOS 29.b, 29.c)

3. **B**   Expected future value after paying deferred capital gains taxes only:

   $$\text{FV}_{CGT} = \text{V}_P\left[(1 + r)^n\,(1 - t_{cg}) + t_{cg}\right] = \$1,000\left[(1 + 0.09)^{10}\,(1 - 0.20) + 0.20\right.$$

Note that because the question indicates the $1,000 investment is made at the start of the analysis period there can be no initial unrealized gain or loss and the basis, B, must be 1.0. (LOS 29.b)

4. **A**   When only deferred capital gains taxes are paid, tax drag % is the same as the tax rate, in this case 20%. (LOS 29.c)

5. **B**   Expected future value when both deferred capital gains taxes and cost basis are considered:

$$\text{FV}_{\text{CGBT}} = \text{V}_{\text{P}}\left[(1+r^n)\left(1-t_{cg}\right) + t_{cg}B\right] = \$1,000\left[(1+0.12)^{10}\left(1-0.20\right) + 0.\right.$$

(LOS 29.b)

6. **B**   Statement 1 is correct. Statement 2 is incorrect. With accrual taxation, taxes are paid each period and the potential benefits of compounding return pretax are lost. As the holding period is extended or the pretax return is increased, both the tax drag amount and percent increase. (LOS 29.c)

7. **B**   With deferred capital gain, all tax is deferred and no compounding of return benefit is lost. Tax drag percent will equal the CG tax rate when the starting basis (B) is 1. (LOS 29.b, 29.c)

Module Quiz 29.3

1. **A**   Expected future value with wealth taxes only:

$$\text{FW}_{\text{WT}} = \text{V}_{\text{P}}[(1 + r)(1 - t_w)]^n$$

$$= 1,000[(1 + 0.14)(1 - 0.03)]^{15}$$

$$= \$4,520.11$$

(LOS 29.b)

2. **B**   If the wealth tax rate in the previous question were zero, the expected future value of the investment would have been:

$$\text{FV} = \$1,000[(1 + 0.14)(1 - 0)]^{15}$$

$$= \$7,137.94$$

The effect of taxes is a reduction of investment value of $2,617.83

(= $7,137.94 – $4,520.11). On a percentage basis, the tax drag is 42.65%

[= $2,617.83 / ($7,137.94 – $1,000)].

(LOS 29.c)

3. **A**   Both statements are correct. The tax drag as a proportion of the future investment value increases with the investment horizon. However, as the investment return increases, the tax drag % on the future investment value decreases. (LOS 29.c)

4. **C**   The return after taxes on interest income, dividends, and realized capital gains factors in the proportions of the return sources and the respective taxes on each:

$$r^* = r\left[1 - \left(p_i t_i + p_d t_d + p_{cg} t_{cg}\right)\right] = r(1 - \text{wartr}) = 0.15\left[1 - 0.10\left(0.35\right) - 0.2\right.$$

(LOS 29.b)

5. **B** The effective capital gains tax rate that adjusts for the annual taxes already paid is:

$T^* = t_{cg}[p_{\text{deferred cg}} / (1 - \text{wartr})]$

$\text{wartr} = p_i t_i + p_d t_d + p_{cg} t_{cg} = 0.20 \left[\frac{1 - 0.10 - 0.25 - 0.35}{1 - 0.10\,(0.35\,) - 0.25\,(0.20\,) - 0.35\,(0.20)} \right] = 0.20 \left[\frac{0.30}{0.845} \right] = 0.$

(LOS 29.b)

6. **B** Expected future value after all taxes ($FVIF_T$) using the effective capital gains tax rate (i.e., some capital gains realized annually and some deferred):

$FV_T = V_p[(1 + r^*)^n(1 - T^*) + T^* - (1 - B)t_{cg}]$

$= \text{€}100,000[(1 + 0.1268)^7(1 - 0.0710) + 0.0710 - (1 - 1)0.20] = \text{€}221,361.22$

(LOS 29.b)

7. **B** The expected balance in the account in seven years after payment of all taxes:

$FV = \text{€}100,000[(1 + 0.1268)^7(1 - 0.0710) + 0.0710 - (1 - 0.80)0.20] = \text{€}217,361.22$

(LOS 29.b)

Module Quiz 29.4

1. **B** The expected after-tax balance in the account in 20 years:

$FV_{TDA} = V_P(1 + r)^n(1 - t_n)$

$= \text{€}100,000[(1.10)^{20}(1 - 0.30)]$

$= \text{€}470,925$

(LOS 29.d)

2. **C** The expected balance in the account in 20 years (no taxes are paid):

$FV_{TEA} = V_P(1 + r)^n$

$= \text{€}100,000(1.10)^{20}$

$= \text{€}672,750$

€386,968 is the expected future value of an account taxed annually (accrual taxes). €500,925 is the expected future value of an account with deferred capital gains taxes and a basis of €100,000. (LOS 29.d)

3. **A** The investor has €480,000 [(€800,000 × (1 − 0.40)] after-tax invested in equity. The bonds in the tax-exempt account are not subject to taxation and thus are not adjusted. On an after-tax basis, the investor has 44.4% in equity [€480,000 / (€480,000 + €600,000)] and the other 55.6% in bonds [€600,000 / (€480,000 + €600,000)]. (LOS 29.d)

4. **B** Because the current tax rate is less than the future tax rate, the tax-exempt account will have a higher expected future accumulation, even though contributions are made from after-tax dollars. The following calculations are unnecessary to answer the question but illustrate its proof.

If the investor pays current taxes at 20% and is willing to give up $2,000 in consumption, she can contribute $2,500 to a tax-deferred account. Because contributions to TDAs are treated as tax deductions against income, the $2,500

contribution will save her $2,500 × 0.20 = $500 in taxes. Therefore, her net consumption would be reduced by only $2,000.

Alternatively, she could invest $2,000 in after-tax dollars in a tax-exempt account. Future value calculations:

FVIF Formula	Future Value
$FVIF_{TDA} = (1 + r)^n(1 - t_n)$	$\$2,500[(1 + 0.12)^{30}(1 - 0.30)] = \$52,430$
$FVIF_{TEA} = (1 + r)^n$	$\$2,000(1 + 0.12)^{30} = \$59,920$

(LOS 29.d)

5. **C**   Some countries exempt the interest income for some types of bonds from taxation. Because most of the return from bonds is income, there is no benefit to placing such tax exempt bonds in a tax deferred account because no tax is owed. The after-tax return from standard (taxable) corporate bonds would benefit from locating them in the TDA because their income return is generally taxed. High-growth stocks pay small dividends and provide most of their return from capital gains. By extending the holding period, tax deferral will be possible even in a taxable account. So the greatest benefit is from locating the corporate bonds in the TDA. (LOS 29.d)

Module Quiz 29.5

1. **B**   The taxable account will have the lowest risk because the government (taxing authority) effectively shares the risk of the investment with the investor. Assuming before-tax standard deviation of σ, the after-tax standard deviation of the investment is $\sigma(1 - T_I)$. (LOS 29.e)

2. **A**   The trader will have the lowest future accumulation because her capital gains will be short term, taxed at a high rate, and taxed every year. The active investor will have the next lowest future accumulation because, although gains are taxed at a lower rate, the gains are taxed every year. The passive investor will pay a low tax rate on a deferred basis and have the highest accumulations of the three investors. (LOS 29.f)

Module Quiz 29.6

1. **C**   If the stock is sold, there is a capital loss of £90,000 – £140,000 = –£50,000, making net taxable gain £30,000. The tax is 0.30 × £30,000 = £9,000.

   If the stock is not sold, the taxes on the full gain are £80,000 × 0.30 = £24,000. The recognition of the capital loss would result in a tax savings of £24,000 – £9,000 = £15,000. In this case, the tax alpha from harvesting the loss can also be calculated as the capital loss multiplied by the tax rate: £50,000 × 0.30 = £15,000. (LOS 29.g)

2. **A**   While this may look like a calculation question, it is really a concept question. The appreciation rate is the same in both cases and assuming future tax rates do not change (which is the only acceptable assumption when nothing is said), there is a benefit to the tax deferral inherent in tax loss harvesting. Tax loss harvesting changes the pattern of tax payments [i.e., the payment(s) is (are) pushed further into the future]. However, if the stock is sold in the current year, the tax savings of $15,000 can be immediately reinvested and earn the 10% return. Thus, Strategy 1 will provide the higher future accumulation. (LOS 29.g)

3. **A**   Both the risk and return of the asset classes would be adjusted to reflect the tax rates and situation of that specific investor. (LOS 29.h)

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1. The terminology used throughout this topic review is industry convention as presented in Reading 29 of the 2020 Level III CFA exam curriculum.

2. The $173,000 taxable income in our example was assumed to be ordinary income, which consists of salary, wages, commissions, et cetera, and is subject to taxation at standard rates. If a tax regime does not provide special treatment for income from investments, then dividends, interest, and capital gains would be added to income from salary, et cetera and taxed as ordinary income.

READING 30: ESTATE PLANNING IN A GLOBAL CONTEXT

Study Session 12

EXAM FOCUS

As with the previous reading, the purpose here is not to teach law and regulation of a specific country but concepts and calculations relevant to wealth management. Be prepared to make calculations and understand the implications discussed in this section.

MODULE 30.1: ESTATE PLANNING

LOS 30.a: Discuss the purpose of estate planning and explain the basic concepts of domestic estate planning, including estates, wills, and probate.

Video covering this content is available online.

CFA® Program Curriculum, Volume 5, page 287

Your **estate** is everything you own: financial assets; real estate (a.k.a. *immovable property*); collections such as art, stamps, or coins; businesses; and non-tangible assets, such as trademarks, copyrights, and patents. **Estate planning** is the planning process associated with transferring your estate to others during your lifetime or at death so that the assets go to the individuals or entities you intend and in the most efficient way.

The most common tool used to transfer assets is a **will** (a.k.a. a *testament*). A will is the legal document that states the rights others will have to your assets at your death. The person transferring assets through a will is known as the *testator*.

Probate is a legal process that takes place at death, during which a court determines the validity of the decedent's will, inventories the decedent's property, resolves any claims against the decedent, and distributes remaining property according to the will. Probate involves considerable paperwork and court appearances, and all costs associated with the probate process, which can be significant, are borne by the decedent's estate. If the decedent leaves no will or if the will is deemed invalid, the decedent is said to have died *intestate* and the distribution of assets is determined by the court.

Assets *solely owned* by the decedent must be transferred by a will through the probate process. Due to the cost, the time it takes, and the public nature of the probate process, however, individuals often take steps to avoid it. This can be accomplished through joint ownership with rights of survivorship, living trusts, retirement plans, life insurance, and other means which transfer assets outside the probate process (i.e., without the need for a will).

WEALTH TRANSFER TAXES

CFA® Program Curriculum, Volume 5, page 290

The two primary means of transferring assets are through **gifts** and **bequests**. Gifts are referred to as *lifetime gratuitous* (without the intent of receiving value in return) *transfers* or *inter vivos* (between living individuals) transfers and may be subject to **gift taxes**. Whether the gift is taxed and who pays the tax is determined by the taxing authorities involved. Assets transferred through bequests are referred to as *testamentary* (after death) *gratuitous transfers* and can be subject to **estate taxes**, paid by the grantor (i.e., transferor), or **inheritance taxes**, paid by the recipient.

> **PROFESSOR'S NOTE**
>
> The tax treatment of testamentary transfers varies across tax systems and even in the same system according to the relationship between the transferor and recipient. In many cases, for example, transfers between spouses are not subject to taxes. Even when not between spouses, most transfers are subject to exclusions (statutory allowances), which state a maximum that may be transferred tax free.

Many jurisdictions that impose gift taxes also provide exclusions. As of 2009 in the United States, for example, the first $13,000 given to a single recipient is exempt from taxation, subject to limitations depending upon the location and type of the asset and the tax status of the recipient. For example, the asset might be cash or securities or even real estate located in another country, and the entity could be a relative, friend, or charity in the same or another country. Thus, the first $13,000 is exempt from U.S. gift taxes, but the recipient could have to pay gift taxes under another tax regime.

Tax laws across the globe can vary dramatically. Many of the differences are due to the foundations upon which the tax systems are based. For example, a **civil law** system is based on old Roman law. In this system, laws are handed down (i.e., a top down system) by a legislative body.

Common law systems, based primarily on old English law, are more "bottom up." Judges play very important roles in common law systems by refining any existing laws to meet particular situations. Once made by a judge, the decisions become *precedent* to be applied in future cases.

Ownership Rights

Although on the surface it might seem rather clear cut, the precise legal meaning of *ownership* can be shaped by the legal regime. Some regimes provide statutory ownership that effectively gives one person the right to the assets of another. If the system has **forced heirship** rules, for example, children have a right to a portion of a parent's estate, regardless of the location of the child vis-à-vis the parent, the relationship that exists between the parent and child, or even the relationship between the parents.

Knowing the situation could arise, wealthy individuals might try to avoid forced heirship rules by gifting assets or moving them "offshore" into a trust where they fall under a different taxing authority with no forced heirship rule. Recognizing this, many regimes apply **clawback** provisions that add the values back to the decedent's estate before calculating the

child's share. If the estate isn't sufficient to meet the child's entitlement, the child may in some cases legally seek the difference from those who received the gifts.

In addition to marital rights provided under forced heirship rules, spouses can also have marital property rights according to the type of marriage they are in. Under a **community property rights** regime, each spouse is entitled to one-half of the estate *earned during* the marriage. Gifts and inheritances received before or during the marriage may be held separate from marital assets. Assets not distributed under community property rights are distributed according to the will.

> **PROFESSOR'S NOTE**
>
> Assets that are not considered part of marital assets under a community property rights regime are considered part of the total estate for purposes of forced heirship rules. Also, a marital right to the estate is a form of forced heirship.

Under a **separate property rights** regime, which is common in civil law countries, each spouse owns and controls his or her property, separate from the other. Each spouse may, barring the presence of other forced heirship rules, bequeath assets as they wish.

EXAMPLE: Property rights and forced heirship

Hope and Larry have been married for 40 years. They have two married children, Emma, age 32, and Toby, age 34. The community property regime under which the family lives provides that at the death of a spouse, the surviving spouse has the right to one-half the marital estate (community property). In addition, a forced heirship rule entitles a surviving spouse to 30% of the estate, and children are entitled to split 30% of the estate. During the marriage, Larry inherited $500,000 from his parents. His inheritance is not considered part of marital assets, which total $1,300,000.

If Larry should die:

A. **Determine** the amount Hope would inherit under both of the forced heirship rules.

B. **Determine** the amount each child would inherit under the forced heirship rule.

Answer:

A. Under the community property provision, the surviving spouse is entitled to one-half the *marital estate*. The marital estate includes assets totaling $1.3 million. Larry's $500,000 inheritance is considered part of the *total estate*, but not part of community property (marital estate).

When the country has both community property rights and forced heirship rules, as in this case, the surviving spouse is entitled to the *greater* of the two amounts:

- Under community property, Hope is entitled to half the marital property or $1,300,000 / 2 = $650,000.

- Under the forced heirship rule, Hope is entitled to 30% of the total estate or (0.30) ($1,800,000) = $540,000.

- Hope is entitled to the greater of the two amounts, so she would receive $650,000 under community property rights. She could inherit more based on the stipulations of Larry's will.

B. Under the forced heirship rules, the two children are entitled to *split* 30% of the total estate for (0.30) ($1,800,000) = $540,000 in total for $270,000 to each child.

In total, only $650,000 + $540,000 = $1,190,000 of the total $1.8 million is distributed according to forced heirship rules. (The marital community property rights provision is a type of forced heirship rule.) The remaining $610,000 would be distributed through a probate process according to Larry's will.

EXAMPLE: Clawback provision

Assume a country with forced heirship rules entitling children to split 33% of the estate of a deceased parent, subject to clawback provisions. The estate of the (unmarried) decedent is worth $500,000 after

gifting $2,750,000 to two of his children in anticipation of death. An estranged child has now come forth to claim his legal right under the community property described in the question data. *Based solely on this information*, **determine** the amount the estranged child is entitled to under the forced heirship rule.

Answer:

The three children of the deceased are entitled to *split* 33% of the parent's estate or 0.33($3,250,000) = $1,072,500.

> **PROFESSOR'S NOTE**
>
> According to the clawback provision, we use the total value of the estate ($500,000 + $2,750,000 = $3,250,000) before the gifts.

Because there are apparently three children (the two who received gifts and the estranged child), each is entitled to $1,072,500 / 3 = $357,500 under the forced heirship rule.

Because the estate is worth $500,000 after the gifts, the estranged child is able to receive $357,500 without resorting to lawsuits to reclaim part of the gifts from the other two children.

MODULE QUIZ 30.1

To best evaluate your performance, enter your quiz answers online.

1. The main objectives of estate planning are to minimize taxes and:
   A. achieve effective diversification.
   B. transfer assets to heirs or others.
   C. determine how assets will be passed on at death.

2. As long as an individual has paid taxes during their lifetime, the individual may leave their surviving spouse:
   A. all of their estate.
   B. all of their estate less any required forced heirship distribution.
   C. only the maximum allowed by marital rights.

MODULE 30.2: ESTIMATING CORE CAPITAL

LOS 30.c: Determine a family's core capital and excess capital, based on mortality probabilities and Monte Carlo analysis.

CFA® Program Curriculum, Volume 5, page 292

To understand the concepts of core and excess capital, consider a balance sheet; assets are on the left side and liabilities and equity are on the right; of course, equity equals asset minus liabilities.

On an individual's balance sheet, assets consist of the financial and other assets currently held by the individual plus the *present value* of net employment income expected to be generated over the lifetime, referred to as **human capital** or **net employment capital**. (Human capital is discussed at length in Topic Review 32.) In other words, the individual's *total assets* equal the value of assets currently held plus the individual's ability to accumulate more assets in the future through employment (i.e., generate more future income than is required to meet all future expenses).

The individual's liabilities on the balance sheet are the present values of all current and future costs necessary to sustain a given lifestyle. These consist of any explicit liabilities, such as mortgage or other loan payments plus costs of living and any planned gifts and bequests. Just as with a financial balance sheet, then, the individual's **excess capital** (i.e., equity capital) is the difference between total assets and total liabilities.

The amount of assets necessary to meet all the individual's liabilities plus a reserve for unexpected needs is considered the individual's (or family's) **core capital**. It's the amount that must be maintained to meet all present and future liabilities as described previously. Any amount above core capital is considered excess capital and can be used for other purposes. Hint: In the following examples, no reserve for unexpected needs is given so one is not included. On the exam you should only include such an amount if given clear direction.

Mortality Probabilities

A major problem associated with estimating the individual's human capital and total liabilities, of course, is determining the values of future net employment income and required future outlays. Compounding the problem is determining the individual's lifetime. To estimate an individual's remaining expected life, statisticians developed *mortality tables*. Mortality tables show an individual's expected remaining years based upon attaining a given age. For example, one of these tables might show that a male who has reached the age of 80 has approximately an 87% probability of living one more year and a 16% probability of living to age 93.

> **For the Exam:** The probabilities of survival change every year. They are based on the individual's current age and show the probability for the *average individual* who has attained that age. In our previous discussion, once the 80-year-old male reaches 85, the probability of him living to 93 increases somewhat because at 80, living to 93 means surviving another 13 years, while at 85, it means surviving only another eight years. Of course, the probability of surviving a set *number* of years decreases as the individual ages. If you are required to perform related calculations on the exam, the question will have to include a mortality table.

Consider the following mortality table, which is adapted from the 2020 CFA Level III curriculum.[1] The husband and wife are currently 79 and 68, respectively. From the table we see that the husband has a 93.55% probability (Prob.) of living one more year, to the age of 80, and a 46.74% probability of living eight more years, to the age of 87. The wife has a 98.31% probability of living one more year (age 69) and 82.52% probability of living eight more years (age 76). Additional explanation follows the table.

Figure 30.1: Individual and Joint Mortality Probabilities and Core Capital

Yrs	Husband		Wife		Combined Prob.	Real Annual Spending	Expected Real Spending	Present Value	Total
	Age	Prob.	Age	Prob.					
1	80	0.9355	69	0.9831	0.9989	200,000	199,780	195,863	195,863
2	81	0.8702	70	0.9649	0.9954	204,000	203,062	195,177	391,040
3	82	0.8038	71	0.9457	0.9893	208,080	205,854	193,981	585,021
4	83	0.7339	72	0.9249	0.9800	212,242	207,997	192,157	777,178
5	84	0.6686	73	0.9025	0.9677	216,486	209,494	189,745	966,923
6	85	0.6001	74	0.8785	0.9514	220,816	210,084	186,549	1,153,472
7	86	0.5327	75	0.8526	0.9311	225,232	209,714	182,569	1,336,041
8	87	0.4674	76	0.8252	0.9069	229,737	208,348	177,823	1,513,864
9	88	0.4048	77	0.7958	0.8785	234,332	205,861	172,255	1,686,119
10	89	0.3459	78	0.7646	0.8460	239,019	202,210	165,883	1,852,002
11	90	0.2912	79	0.7311	0.8094	243,799	197,331	158,706	2,010,708

- **Combined Prob.** is the (joint) probability that one or both will live to the given age. For example, there is a 98% probability that *at least* one of them will live four years.
- **Real Annual Spending** (i.e., living expenses) for the coming year is expected to be $200,000 and is expected to increase at a rate of 2% per year.
- **Expected Real Spending** is *Real Annual Spending* multiplied by *Combined Prob.* It shows the expected amount required for the year based on the probability of either or both remaining alive.
- **Present Value** is *Expected Real Spending* discounted to year zero at the real, risk-free rate of 2%.
- **Total** is a running total. It's the amount of core *capital required* to meet living expenses through the given year. For example, assuming no further contributions, it will take a portfolio of $1,153,472 (today) to meet estimated expenses for six years.

PROFESSOR'S NOTE

The full table includes enough rows for both to reach 100 years of age. At 100 years old, individuals are assumed to have 0% probability of living another year.

EXAMPLE: Calculating core capital using a mortality table

A. Using the mortality table, **determine** the probability that either the husband, the wife, or both will be alive in 10 years.

B. Based on expenditures in the table, **calculate** the core capital required for the next 10 years.

C. If the family has a portfolio of $2,500,000, **determine** (based solely on the information provided) the maximum amount they could give to charity.

Answer:

A. From the mortality table, we see the probability of surviving 10 years for the husband and wife is 34.59% and 76.46%, respectively. The probability that one or both will survive 10 years (Combined Prob.) is calculated as follows:

$$
\begin{aligned}
\text{prob (joint survival)} \ &= \ \text{prob (husband survives)} + \text{prob (wife survives)} \\
&\quad - \text{prob (husband survives)} \times \text{prob (wife survives)} \\
&= 0.3459 + 0.7646 - (0.3459)(0.7646) = \mathbf{84.60\%}
\end{aligned}
$$

B. The amount of core capital required for 10 years is:

$$
\begin{aligned}
\text{core capital}_{10\ \text{years}} \ &= \ \sum_{t=1}^{10} \frac{P(\text{surv}_t)(\text{spending}_t)}{(1+r)^t}; r = \text{real risk-free rate} \\
&= \frac{P(\text{surv}_1)(\text{spending}_1)}{(1.02)^1} + \ldots + \frac{P(\text{surv}_{10})(\text{spending}_{10})}{(1.02)^{10}} \\
&= \$1,852,002
\end{aligned}
$$

$1,852,002 is calculated by multiplying the real annual spending requirement for each year by the joint probability associated with that year, finding the present value of the result at the risk-free rate, and then summing the present values for all 10 years. For example, the core capital requirement (portfolio value required today) for the next years is:

$$
\begin{aligned}
&\text{core capital}_{3\ \text{years}} \\
&= \frac{P(\text{surv}_1)(\text{spending}_1)}{(1+r)^1} + \frac{P(\text{surv}_2)(\text{spending}_2)}{(1+r)^2} + \frac{P(\text{surv}_3)(\text{spending}_3)}{(1+r)^3} \\
&= \frac{0.9989(\$200,000)}{(1.02)} + \frac{0.9954(\$204,000)}{(1.02)^2} + \frac{0.9893(\$208,080)}{(1.02)^3} \\
&= \$585,021
\end{aligned}
$$

Safety Reserve

Mortality tables are based on average life expectancy. If the amount in excess of the core capital calculated with a mortality table were gifted away, there is an approximate 50% chance the gift giver will outlive the remaining capital. Thus, core capital should be increased by a safety reserve.

In addition, the core-capital model implicitly assumes an average risk-free rate of return on assets, ignoring the possibility of poor market returns. Finally, the spending needs could have been underestimated or could be front loaded (i.e., more spending is needed now even if spending diminishes later). Either lower initial portfolio returns or more initial spending could create a path dependency risk of drawing down the portfolio and diminished chances of recovery later.

Monte Carlo Simulation

Monte Carlo analysis is commonly used in retirement planning. Depending on the sophistication of the model, the user can input the starting portfolio value and assumptions for:

- Distribution amounts, both recurring and irregular one-time distributions.
- Inflation rates.
- Asset class returns and correlations.
- Return distributions, either normal or non-normal.
- Tax rates.
- And any other relevant factors.

Hundreds or thousands of simulation runs can be generated and ranked with output displayed in various forms.

One common display would chart the value of the portfolio over time at some specified probability. For example, plot the portfolio value at the 5% probability, allowing the client and manager to see how long the portfolio is expected to last. If the results are unacceptable, then adjustments can be made. Common changes would be to adjust the asset mix and expected return or the distribution amount and/or start date of the distributions.

A particular benefit of the analysis is to capture the interaction of distribution and the sequence of returns, a form of path dependency. Without distributions, the sequence of returns is not important. A portfolio that increases and then decreases 20% in value has the same ending value as one that decreases and then increases 20%. But with distributions the sequence will matter. If the portfolio first declines, the distribution will consume a larger portion of the portfolio and the portfolio value will be diminished when return rebounds. This increases the chances the client will run out of funds.

Another display format is to show the **probability of ruin** (reaching a zero portfolio value) based on differing start dates for retirement (start of withdrawals) and distribution percentage. Delaying retirement or lowering the distribution percentage make it less likely the portfolio can be exhausted.

Consider the following ruin probability table based on the example from the CFA text. The table is built on an assumed 5% average arithmetic return with a 12% standard deviation. It shows that if the initial distribution starts at 3% of portfolio value, the distribution amount increases with inflation, and retirement begins at age 55, there is a 6.3% chance of exhausting the portfolio by the median age of death at 83. If retirement is delayed until age 60, the ruin probability declines to 5.2% by the median age of death at 83.4.

Figure 30.2: Ruin Probabilities and Spending Rates

Retirement Age	Median Age at Death	Hazard Rate		Real Spending Rate		
				2%	3%	4%
55	83.0	2.48	Probability of Ruin	1.8	6.3	14.0
60	83.4	2.96		1.5	5.2	11.6

MODULE QUIZ 30.2

To best evaluate your performance, enter your quiz answers online.

Joe Angelone, age 65, recently retired after a long career in the aerospace industry, first as a fighter pilot in the Vietnam War, then as a fighter test pilot, and finally as a project manager overseeing the testing and production of fighter planes. He and his wife Charlene, age 63, recently retired in Texas. Even though they are retired, they prefer to maintain their current lifestyle with spending needs of $80,000 per year in real terms. Inflation is expected to be 3% with the nominal risk-free rate equal to 5%. The Angelones' survival probabilities for the next three years are shown in the table below.

Year	Joe		Charlene	
	Age	P(Survival)	Age	P(Survival)
1	66	0.992	64	0.997
2	67	0.982	65	0.987
3	68	0.972	66	0.967

1. A. **Determine** the probability that either Joe, Charlene, or both will survive for three years.

B. **Calculate** the capitalized value of the Angelones' core spending needs over the next three years.

2. To calculate core capital for an individual, you would:
   A. forecast future nominal needs, discount at the real risk-free rate, and then add a safety reserve.
   B. forecast future real needs, discount at the real risk-free rate, and then subtract a safety reserve.
   C. use Monte Carlo simulation to project how long existing capital is projected to last.

MODULE 30.3: GIFT VS. BEQUEST

LOS 30.d: Evaluate the relative after-tax value of lifetime gifts and testamentary bequests.

LOS 30.e: Explain the estate planning benefit of making lifetime gifts when gift taxes are paid by the donor, rather than the recipient.

CFA® Program Curriculum, Volume 2, page 302 and 307

A client with excess capital can gift the capital now or bequest it at death. There are practical issues to consider: Gifting now likely gives up control and cannot be revoked if circumstances change. There are also tax issues to consider that can affect the ultimate value of the gift/bequest to the receiver.

One approach is to calculate a ratio of a gift now versus bequest at death. A ratio above/below 1 indicates that from a tax perspective it is favorable/unfavorable to gift now. The calculations are based on the FV after-tax to the receiver. Any FV after-tax calculations require assumptions and the conclusions are only as good as the assumptions.

The basic form of the ratio is:

$$\frac{\text{FV after tax to the receiver if gifted now}}{\text{FV after tax to the receiver if bequested at death}}$$

There are three tax scenarios to consider:

- The gift now is tax free to both the receiver and the donor.
- The gift now is taxable with the tax paid by the receiver.
- The gift now is taxable with the tax paid by the giver, also called the donor.

The relevant tax factors to consider are:

- r_g and t_{ig} are the pretax return earned and the applicable tax rate on those earnings for assets held by the gift receiver.
- r_e and t_{ie} are the pretax return earned and the applicable tax rate on those earnings for assets held by the gift giver.
- T_e is the estate tax rate and would be paid from the estate.
- T_g is the gift tax rate, paid by the giver (or by the receiver if specified by the facts in the question).
- g/e is the percentage of the giver's wealth being gifted.

The three potential RV ratios are:

RV of a tax-free gift, $T_g = 0$

$$\text{RV}_{\text{tax-free gift}} = \frac{\left[1 + r_g\left(1 - t_{ig}\right)\right]^n}{\left[1 + r_e\left(1 - t_{ie}\right)\right]^n (1 - T_e)}$$

RV of a taxable gift, T_g paid by receiver

$$\text{RV}_{\text{taxable gift}} = \frac{\text{FV}_{\text{taxable gift}}}{\text{FV}_{\text{bequest}}} = \frac{\left[(1 - T_g)\right]\left[1 + r_g\left(1 - t_{ig}\right)\right]^n}{\left[1 + r_e\left(1 - t_{ie}\right)\right]^n (1 - T_e)}$$

RV of a taxable gift, T_g paid by giver

$$\text{RV}_{\text{taxable gift}} = \frac{(1 - T_g + T_g T_e)\left[1 + r_g\left(1 - t_{ig}\right)\right]^n}{\left[1 + r_e\left(1 - t_{ie}\right)\right]^n (1 - T_e)}$$

Notice that each formula is a cumulative variation on the previous formula.

RV of a tax-free gift, $T_g = 0$: The numerator projects FV after-tax of the investment if held by the receiver. The denominator projects the FV after-tax if held by the giver and then subject to estate taxes.

RV of a taxable gift, T_g paid by receiver: This is a variation on the tax-free gift formula with a subtraction in the numerator of $-T_g$ to reflect the receiver of the gift must pay a tax and has less to invest. All else the same, it makes gifting now less attractive.

RV of a taxable gift, T_g paid by giver: This is a variation on the taxable gift if paid by receiver formula with the addition of $+T_g T_e$ in the numerator. All else the same, the giver's estate is reduced and therefore the future estate tax will be lower. One interpretation is gifting now creates a partial gift tax credit against the estate tax bill.

> **EXAMPLE: Gifting now vs. a bequest**
>
> Mary Jane is considering making a gift now or at bequest. The assumptions are:
> - Life expectancy is 20 years.
> - Jane's pretax return and investment tax rate are 8% and 35%.

- Receiver's pretax return and investment tax rate are also 8% and 35%.
- T_g and T_e are 25% and 40%.

Scenario 1: Assuming the gift is not subject to gift taxes, **compute** the relative attractiveness of a gift or bequest and **recommend** the best approach:

$$[1 + (0.08(1 - 0.35))]^{20} / [(1 + (0.08(1 - 0.35)))^{20} (1 - 0.40)] = 2.756 / ((2.756)(0.60)) = 2.756 / 1.654 = 1.67$$

Gifting now is more attractive. Also notice because the giver and receiver's after-tax investment return is assumed to be the same, the ratio is just $1 / (1 - T_e)$, a special case of the formula.

Scenario 2: Assuming the gift is subject to gift taxes and the tax is paid by the receiver, **compute** the relative attractiveness of a gift or bequest and **recommend** the best approach:

$$[(1 - 0.25)(1 + (0.08(1 - 0.35)))^{20}] / [(1 + (0.08(1 - 0.35)))^{20} (1 - 0.40)] = ((0.75)(2.756)) / ((2.756)(0.60)) = 2.067 / 1.654 = 1.25$$

Gifting now is not as favorable but still best. Also notice because the giver and receiver's after-tax investment return is assumed to be the same, the ratio is just $(1 - T_g) / (1 - T_e)$, a special case of the formula.

Scenario 3: Assuming the gift is subject to gift taxes, and the tax is paid by the giver, **compute** the relative attractiveness of a gift or bequest and **recommend** the best approach:

$$[(1 - 0.25 + (0.25)(0.40))(1 + (0.08(1 - 0.35)))^{20}] / [(1 + (0.08(1 - 0.35)))^{20} (1 - 0.40)] = ((0.75 + 0.1)(2.756)) / ((2.756)(0.60)) = 2.343 / 1.654 = 1.42$$

Gifting now is still best and more attractive than if the receiver pays the tax. Also notice because the giver and receiver's after-tax investment return is assumed to be the same, the ratio is just $(1 - T_g + T_e T_g) / (1 - T_e)$, a special case of the formula.

MODULE QUIZ 30.3

To best evaluate your performance, enter your quiz answers online.

1. Jan Jones has excess capital and is only concerned with maximizing the value of funds passed onto her heirs. She has an assumed after-tax return on investments of 8.5% with a tax rate on investments of 33%. Her heirs have an assumed pretax return on investments of 8% with a tax rate on investments of 25%. Gift and estate tax rates are 40% and 30% respectively.

   A. If the gift would fall within the gift tax exclusion amount, **discuss** whether it is better to gift now or make a bequest.

B. If the gift would exceed the gift tax exclusion amount, **discuss** whether it is better to gift now or make a bequest.

C. **Discuss** any non-monetary considerations in deciding whether to make a gift versus a bequest.

MODULE 30.4: OTHER ESTATE PLANNING TECHNIQUES

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LOS 30.f: Evaluate the after-tax benefits of basic estate planning strategies, including generation skipping, spousal exemptions, valuation discounts, and charitable gifts.

CFA® Program Curriculum, Volume 5, page 310

Generation Skipping

In the absence of generation-skipping transfer taxes, as in the United States, transferring assets directly to a third generation avoids possible double taxation. When the first (i.e., oldest) generation transfers assets to the second generation, the transfer is typically subject to taxes. Then when the second generation transfers the assets to the third generation, the assets are taxed again.

> **EXAMPLE: Generation skipping**
>
> Assume an expected after-tax return of 5% on assets that will ultimately be transferred to the third generation from the second generation. We'll assume the first generation will transfer the assets to the second generation in 15 years, and the second generation will transfer the assets 30 years after that to the third generation. We'll also assume equal gift and inheritance tax rates of 40%.
>
> **Answer:**
>
> The value of the assets to the third generation in 45 years, without generation skipping and with generation skipping, is:
>
> $$FV_{\text{no skipping}} = PV\left[(1 + 0.05)^{15}(1{-}0.40)\right]\left[(1 + 0.05)^{30}(1{-}0.40)\right]$$
>
> $$= PV(2.0789)(0.60) \times (4.3219)(0.60) = PV(3.2344)$$
>
> $$FV_{\text{skipping}} = PV(1 + 0.05)^{45}(1{-}0.40) = PV(5.3910)$$
>
> With the ability to skip generations, the value to the third generation is increased by a factor of $1 / (1 - t)$, where t is the gift/inheritance tax rate:
>
> $$\frac{1}{1-t} = \frac{1}{1-0.40} = \frac{5.3910}{3.2344} = 1.6667 = \text{relative value of generation skipping}$$
>
> The amount to be transferred, PV, is the excess above the core capital requirements for both the first and second generations. The first generation must first determine its core capital to determine the total excess that can be transferred to future generations. After calculating and then deducting the core capital for the second generation, any remaining excess (PV) can be transferred directly to the third generation.

Spousal Exemptions

Many countries allow tax-free transfers of estates between spouses. Whether or not this is optimal from a tax perspective depends upon other possible gift and inheritance exclusions. For example, assume tax laws permit tax-free transfers of estates less than $500,000. If the decedent leaves a large estate, and assuming the spouse's core capital is satisfied, $500,000 of the estate could be transferred immediately to his children.

In this fashion, $500,000 of the estate is transferred immediately to the children tax free, while if the surviving spouse waited until later to transfer the assets, they could be subject to gift and/or inheritance taxes.

Valuation Discounts

Assets such as marketable securities have readily determined fair market values, but valuing ownership claims in partnerships and other privately held interests can be difficult. Because valuation discounts can reduce the value of wealth transfers and the associated transfer taxes, high net worth individuals will utilize them whenever possible by, for example, transferring interest in a family business.

The value of a nonpublicly traded family business is determined using financial models with discount rates and other assumptions from otherwise comparable publicly traded firms. The resulting value, of course, implicitly assumes the family business is also publicly traded, so

the valuator must reduce it to reflect the family business's **lack of liquidity**. In addition, the *proportion* of the family business transferred may not give the recipient control of the firm's operations, so the value could also be subject to a **minority interest discount**.

An important consideration is that discounts are not typically additive. For example, a 20% liquidity discount plus a 20% minority discount do not necessarily imply a total discount of 40%. The total discount is subject to court approval and both tend to be inversely related to firm size; as the size of the firm increases, the percentage discount falls.

Charitable Gifts (Charitable Gratuitous Transfers)

Returning to the topic of gifting excess capital now or bequething at death, what if the receiver is a tax-exempt charity? This is another variation of the RV formulas. The denominator is the same as in the previous discussion; the giver invests, an estate tax is paid at death, and then the bequest is made. The numerator, which is the FV to the receiver if gifted now, is different and almost always higher because:

- The charity can invest and the asset return earned is not taxed. This is the $(1 + r_g)^n$ term.
- The giver can take an immediate tax deduction for the gift and this will reduce the giver's current tax bill by T_{oi} for each dollar gifted. T_{oi} is the giver's tax rate on ordinary income. Therefore a \$1.00 gift would produce a tax savings of \$1.00(T_{oi}). The formula compounds this tax savings to a FV subject to estate taxes and then bequested at death, as an addition to the gift made now. This is the remainder of the formula in the numerator.

RV of a gift to a charity:

$$RV_{\text{charitable donation}} = \frac{(1+r_g)^n + T_{oi}[1+r_e(1-t_{ie})]^n(1-T_e)}{[1+r_e(1-t_{ie})]^n(1-T_e)}$$

r_g = expected return on the assets in the charity's portfolio

T_{oi} = tax rate on ordinary income

r_e = expected return on the assets in the donor's portfolio

t_{ie} = donor's tax rate on investment income

T_e = estate tax rate

Now assume:

$r_g = r_e = 8\%$
$T_{oi} = 40\%$
$t_{ie} = 30\%$
$T_e = 50\%$
N = 20 years

$$= \frac{(1.08)^{20} + 0.40[1+0.08(0.70)]^{20}(0.50)}{[1+0.08(0.70)]^{20}(0.50)}$$

$$= \frac{4.6610 + 0.40(2.9736)0.50}{(2.9736)0.50} = 3.5349$$

The assets FV to the receiver are 3.5349 times greater if given now than if given as a bequest at death.

Trusts

LOS 30.g: Explain the basic structure of a trust and discuss the differences between revocable and irrevocable trusts.

CFA® Program Curriculum, Volume 5, page 314

Trusts are a means by which a **grantor** (or **settlor**) can transfer assets to beneficiaries outside of the probate process. The trustee (i.e., manager of the trust) holds the assets and manages them in the best interests of the beneficiaries according to the constraints of the trust documents.

> **PROFESSOR'S NOTE**
>
> Asset ownership can be a fuzzy concept with trusts. It might help to think of the assets as being placed into limbo somewhere between the settlor and the beneficiary. A trustee actually has possession of and manages the assets for the benefit of the settlor and/or beneficiaries and may be considered the owner of the assets for tax purposes only. Legal ownership of the assets may be held by the settlor or transferred to the trustee or beneficiaries, while ownership for tax purposes may reside with the settlor or the trustee. Thus, the legal owner and the owner for tax purposes may be two different entities, depending on the structure of the trust.

In a **revocable trust**, the settlor can rescind (i.e., revoke) the trust and resume ownership of the assets. The settlor is considered the legal owner of the assets for tax and reporting purposes, and creditors, divorcing spouses, et cetera can make claims against the trust assets.

In an **irrevocable trust**, the settlor relinquishes ownership and control. The trustee is considered the owner of the assets for tax purposes and is responsible for reporting and paying taxes on income generated by the trust. The irrevocable trust protects the trust assets from claims against the settlor.

> **PROFESSOR'S NOTE**
>
> A trust will not protect assets if it is deemed to have been created in anticipation of a claim.

The trustee may be responsible for distributing assets to the beneficiaries. In a **fixed trust**, the pattern of distributions to the beneficiaries is predetermined by the settlor and incorporated into the trust documents. When setting up a trust for a minor, for example, the settlor may wish the trustee to distribute a fixed portion of the assets when the minor reaches 21 years of age and then distribute a given percentage each year until they are depleted.

With a **discretionary trust**, the trustee determines how the assets are to be distributed. The primary concern is that the assets are distributed to produce the greatest benefit to the beneficiary or beneficiaries. The settlor can convey her general wishes through the trust documentation or separately through a *letter of wishes*. Beneficiaries have no legal right to either the income or the assets of the discretionary trust. Thus, the trust assets are protected from claims *against the beneficiaries*.

A **spendthrift trust** is used to transfer assets to a beneficiary who is too young or is otherwise unable to manage the assets. It provides a means for the settlor to transfer assets outside the probate process while maintaining some control over the distribution of the assets.

In some countries, trusts are recognized as legally transferring the ownership of assets but not for tax purposes. If that is the case, the settlor remains responsible for taxes on income generated by the trust.

Trusts are recognized by, and are thus most prevalent in, common law countries but can be found in (i.e., are recognized by) some civil law countries. Foundations, on the other hand, are most prevalent in civil law countries but can also be found in common law countries.

Life Insurance

LOS 30.h: Explain how life insurance can be a tax-efficient means of wealth transfer.

CFA® Program Curriculum, Volume 5, page 316

As the only assets transferred by the grantor (policy owner) are the premiums paid,[2] life insurance policies represent a very efficient means for transferring assets or even helping beneficiaries pay inheritance taxes. In most jurisdictions, life insurance proceeds pass to beneficiaries without tax consequences, and, depending on jurisdiction, the policy might provide tax-free accumulation of wealth and/or loans to the policy holder on beneficial terms.

Life insurance can be used in combination with a trust. By establishing a trust on behalf of the beneficiaries and making that trust the direct beneficiary of the life policy, the policy holder can transfer assets to young, disabled, et cetera, beneficiaries outside the probate process.

MODULE 30.5: RESIDENCE VS. SOURCE TAXATION

Video covering this content is available online.

LOS 30.i: Discuss the two principal systems (source jurisdiction and residence jurisdiction) for establishing a country's tax jurisdiction.

LOS 30.j: Discuss the possible income and estate tax consequences of foreign situated assets and foreign-sourced income.

CFA® Program Curriculum, Volume 2, page 320 and 321

Income Taxes

- Under **source jurisdiction** (a.k.a. **territorial tax system**) a country levies taxes on all income generated within its borders, whether by citizens or foreigners.
- Under **residence jurisdiction**, the most prevalent type of jurisdiction, a country taxes the income of its residents, whether generated inside or outside the country. In other words, all residents of the country (whether they are citizens or non-citizens of the country) are taxed on their worldwide income. The country does not impose residence jurisdiction on its citizens who are non-residents in the jurisdiction. The U.S. is an exception in that its citizens, regardless of their current place of residence (i.e., whether currently living in the country or not), are taxed on their worldwide income.

  Countries use many different tests to determine residency. They may utilize subjective standards such as personal ties (e.g., family, house) or economic ties (e.g., own a local

business) to the country. They may also use objective measures such as the number of days residing within the country's borders.

Wealth Transfer Taxes

- Under **source jurisdiction**, transfer taxes are levied on assets located within (e.g., real estate) or transferred within a country, whether by citizens or foreigners.
- Under **residence jurisdiction**, citizens and residents pay transfer taxes, regardless of the worldwide location of the assets.

Exit Taxes

In an effort to avoid residence taxation, individuals may renounce their citizenship and move to a less strict jurisdiction. In response, some residence jurisdictions impose an **exit tax**. The amount is usually based on the gains on assets leaving, as if the individual sold the assets and realized the gains. (This is referred to as a **deemed disposition**.) The exit tax could include a tax on income earned for a period (called a **shadow period**) following the expatriation.

Relief From Double Taxation

LOS 30.k: Evaluate a client's tax liability under each of three basic methods (credit, exemption, and deduction) that a country may use to provide relief from double taxation.

CFA® Program Curriculum, Volume 5, page 321

Due to overlapping tax systems, two countries may lay claim to the same income and/or assets for tax purposes. In a **residence-residence conflict**, for example, two countries claim residence for the same individual and hence claim taxing authority over the individual's world-wide assets and income. Alternatively, two countries could claim authority over the same income in a **source-source conflict** (think of a multinational company with operations that generate income in several countries).

In another possible double taxation scenario, an individual might be subject to residence jurisdiction and receive income on assets in a foreign country with source jurisdiction. This is a **residence-source conflict**, because the individual's world-wide assets and income are taxed by the residence jurisdiction, and income generated by the foreign assets is taxed again under the source jurisdiction. In response, some countries have adopted policies that help relieve the double taxation.

The **exemption method** provides complete relief from double taxation. Suppose an individual is subject to 50% residence tax and has $100 of income from and subject to a source country taxing at 40%. Forty dollars will be owed to the source country and the $100 is not then subject to tax in the residence country.

The **credit method** also provides complete relief though not always the lowest total tax bill. Forty dollars would be owed to the source country and $50 to the residence country. A $40 credit for taxes paid can be taken against the $50 and only $10 will be owed to the residence country, making the total tax owed between both countries $50. Had the rates been reversed, $50 is owed to the source country and a $40 credit can be taken against the $40 owed to the residence country making the residence country tax bill $0. The total tax bill is $50. In the

same situation and under the exemption method, the total tax bill is also $50 as the source country collects $50 and the income is exempt in the residence country.

The **deduction method** provides only partial resolution of the residence-source conflict. Under the deduction method, the individual pays the full tax to the source country and is only allowed to *deduct* the amount of taxes paid to the source country in calculating total world-wide income.

> **EXAMPLE: Residence-source conflict**
>
> An individual living in a country that bases income tax on residency has total worldwide income of 1,500,000. 600,000 of that amount is generated in a source jurisdiction country. The domestic country charges 40% income taxes on worldwide income, and the source country charges 35% taxes on income generated within its borders.
>
> **Determine** the income taxes paid on the foreign source income and the country or countries to which it is owed under the:
>
> A. Credit method.
>
> B. Exemption method.
>
> C. Deduction method.
>
> **Answer:**
>
> A. Credit method:
>   - Source country tax is: 600,000(0.35) = $210,000.
>   - Residence country tax would have been: 600,000(0.40) = $240,000. Taking a 210,000 credit leaves $30,000 owed to residence country.
>   - Total taxes are $240,000.
>
> B. Exemption method:
>   - Source country tax is: 600,000(0.35) = $210,000.
>   - Residence country: The income is exempt.
>   - Total taxes are $210,000.
>
> C. Deduction method:
>   - Source country tax is: 600,000(0.35) = $210,000.
>   - Residence country taxable income is: 600,000 − 210,000 = 390,000. Tax is: 390,000(0.40) = 156,000 to residence country.
>   - Total taxes are $366,000.

INTERNATIONAL TRANSPARENCY

LOS 30.l: Discuss how increasing international transparency and information exchange among tax authorities affect international estate planning.

CFA® Program Curriculum, Volume 5, page 325

In the estate planning process, financial advisers should attempt to structure estates to hold and transfer assets in the most tax-efficient ways. This could include holding foreign assets and even holding funds in a foreign country to more efficiently provide living and/or business expenses.

Tax avoidance is legal. Any tax-paying entity or individual would be expected to minimize the amount of taxes paid through various legal tax-reduction strategies. **Tax evasion**, on the other hand, is hiding, misrepresenting, or otherwise not recognizing income so as to *illegally* avoid taxation. To avoid complications related to tax evasion strategies that are ultimately

uncovered through global tax treaties, it is important to structure estates as efficiently and legally as possible.

Most countries attempt to maximize the amount of taxes to which they are legally entitled and to do so enter into global treaties which provide for the sharing of information. In an effort to maximize world-wide taxation on its residents and citizens, for example, the United States demands that global banks disclose the names of U.S. securities owners, whether U.S. citizens or not. In response, many global banks became Qualified Intermediaries (QIs). To avoid disclosing the names of all their customers, the QIs collect all the required information but provide the information on their U.S. customers only. A similar agreement exists in the European Union, by which EU member banks exchange customer information with each other.

MODULE QUIZ 30.4, 30.5

To best evaluate your performance, enter your quiz answers online.

1. Which of the following is *most correct*? When investors make charitable gifts of appreciated securities, they are usually able to:
    A. avoid capital gains taxes but are not able to take a deduction for the gift.
    B. take a deduction in an amount designed to exactly offset the capital gains tax.
    C. deduct the market value of the gift and avoid capital gains taxes.

2. For estate planning purposes, investments in privately held companies are usually tax:
    A. efficient because gains realized are usually taxed at long-term rates.
    B. inefficient because it is difficult to determine fair market value, thus the correct amount to be taxed cannot be determined.
    C. efficient because they can be transferred from an estate using a valuation discount, which reduces the basis on which the transfer tax is calculated.

3. Jim Johnson has a large amount of excess capital. He can either (1) make a very large gift now or bequest at death to his children or (2) make a gift now or bequest at death to his grandchildren.

    A. **Discuss** financial and other considerations that will determine if he will dispose of the assets directly to his children or grandchildren.

    B. **Discuss** how a trust might be used if he has reservations about the ability of his grandchildren to manage the money. **Recommend** and **explain** why a fixed or discretionary trust is likely to be best.

4. Sal Smythe resides in Country X, which imposes a residence tax of 30% on investment return. He is considering an investment in Country V, which has a source tax of 20% and an assumed return of GBP100. Before proceeding any, he checks.

Calculate the tax he owes to each country if there is:

A. no tax treaty.

B. a deduction method tax treaty.

C. a credit method tax treaty.

KEY CONCEPTS

LOS 30.a

A **will** (also known as a *testament*) is used to transfer estate assets at death. **Probate** is a legal process to validate and implement the will after death. Probate can be costly and make details of the will public. Joint ownership with rights of survivorship, living trusts, retirement plans, life insurance, and other means can sometimes be used to transfer assets outside the probate process.

LOS 30.b

Gifts are *lifetime gratuitous transfers* or *inter vivos transfers* and may be subject to **gift taxes**. Bequests are *testamentary gratuitous transfers* and can be subject to **estate taxes**, paid by the grantor, or **inheritance taxes**, paid by the recipient.

Forced heirship rules provide statutory ownership. Many regimes apply **clawback** provisions. Under a **community property rights** regime, each spouse is entitled to one-half of the estate earned *during* the marriage. Under a **separate property rights** regime, each spouse owns and controls his or her property, separate from the other.

LOS 30.c

Core capital is the amount necessary to meet all of an individual's liabilities plus a reserve for unexpected needs. It is the sum of the products of expected spending for each year and the probability of living that long. An individual has 50% probability of outliving mortality table expected life, so incorporate a **safety reserve** into core capital.

Monte Carlo simulation gives the expected portfolio value and distribution of possible values at retirement. The probability of running out of money is known as the *probability of ruin*. Level of spending and probability of ruin are usually positively correlated.

LOS 30.d

Relative value ratios (RV) project the future value to the recipient of making the gift now during the giver's life versus leaving a bequest (gift) at death. An RV > 1 indicates the value of the gift now is higher.

$$RV_{\text{tax-free gift}} = \frac{FV_{\text{tax-free gift}}}{FV_{\text{bequest}}} = \frac{\left[1 + r_g\left(1 - t_{ig}\right)\right]^n}{\left[1 + r_e\left(1 - t_{ie}\right)\right]^n\left(1 - T_e\right)}$$

$$RV_{\text{taxable gift}} = \frac{FV_{\text{taxable gift}}}{FV_{\text{bequest}}} = \frac{\left[\left(1 - T_g\right)\right]\left[1 + r_g\left(1 - t_{ig}\right)\right]^n}{\left[1 + r_e\left(1 - t_{ie}\right)\right]^n\left(1 - T_e\right)}$$

if the receiver pays the gift tax

r_g = pretax return on the stock if gifted and held by the recipient

t_{ig} = tax rate on investment returns if gifted

r_e = pretax return on the stock if held in the estate

$t_{i,e}$ = tax rate on investment returns in testator's portfolio

T_e = estate tax rate

LOS 30.e

When the *donor pays the gift taxes*, the future value of the gift to the recipient is increased by an amount equal to the product of the gift and estate tax rates (T_g and T_e), and the value of the gift:

$$RV_{\text{taxable gift}} = \frac{(1-T_g+T_g T_e)\left[1+r_g\left(1-t_{ig}\right)\right]^n}{\left[1+r_e(1-t_{ie})\right]^n(1-T_e)} \text{if the giver pays the gift tax}$$

LOS 30.f

Skipping a generation can avoid the double taxation of assets. It increases the FV of the gift by a factor of $1/(1-t)$ if all others factors are the same:

$$FV_{\text{no skipping}} = PV[(1+r)^{n1}(1-t)][(1+r)^{n2}(1-t)]$$
$$FV_{\text{skipping}} = PV[(1+r)^N(1-T_e)] \qquad [N = n1 + n2]$$

Many countries allow: (1) **spousal exemptions**, (2) **valuation discounts** to reduce the taxable value of gifts or the estate, and (3) the donor to take a **tax deduction** in the amount of the **charitable gift**. Value of a gift to charity relative to leaving it in a bequest is:

$$RV_{\text{charitable donation}} = \frac{FV_{\text{charitable gift}}}{FV_{\text{bequest}}} = \frac{(1+r_g)^n + T_{oi}\left[1+r_e(1-t_{ie})\right]^n(1-T_e)}{\left[1+r_e(1-t_{ie})\right]^n(1-T_e)}$$

LOS 30.g

In a **revocable trust**, the settlor can rescind the trust and is considered the legal owner of the assets for tax purposes. In an **irrevocable trust**, the settlor relinquishes ownership. The trustee is considered the owner of the assets for tax purposes. An irrevocable trust protects the trust assets from claims against the settlor.

In a **fixed trust**, the pattern of distributions to the beneficiaries is predetermined by the settlor and incorporated into the trust documents. In a **discretionary trust**, the trustee determines how the assets are distributed. A **spendthrift trust** is used to transfer assets to a beneficiary who is too young or is otherwise unable to manage the assets.

LOS 30.h

Premiums paid on life insurance are not usually considered part of the grantor's estate for tax purposes. In most jurisdictions, life insurance proceeds pass to beneficiaries without tax consequences, and, depending on jurisdiction, the policy might provide tax-free accumulation of wealth and/or loans to the policy holder on beneficial terms. By establishing a trust on behalf of the beneficiaries and making that trust the direct beneficiary of a life policy, the policy holder transfers assets to young, disabled, et cetera, beneficiaries outside the probate process.

LOS 30.i

Under **source jurisdiction** (a.k.a. **territorial tax system**) a country levies taxes on all income generated within its borders. Under **residence jurisdiction**, a country taxes the global income of its residents.

LOS 30.j

In response to citizens who renounce their citizenship to avoid taxes, some residence jurisdictions impose an exit tax, usually based on the gains on assets leaving, as if they were

sold (deemed disposition). This could include a tax on income earned for a shadow period.

LOS 30.k

In a **residence-residence conflict**, two countries claim residence for the same individual. In a **source-source conflict**, two countries claim authority over the same income. In a **residence-source conflict**, an individual is subject to residence jurisdiction and receives income on assets in a foreign country with source jurisdiction.

Tax treaties may partially or fully resolve the double taxation of residence-source conflicts. The income is taxed by the source country and then:

- Exemption method: Not taxed by the residence country.
- Credit method: The tax owed to the residence country is computed, and a credit for taxes paid to the source country is applied:
  - If more is owed the residence country, the difference is paid.
  - If less is owed the residence country, the bill is zero.
- Deduction method: Taxes owed the source country reduce the taxable income in (and thereby partial reduce the tax owed to) the residence country.

LOS 30.l

In the estate planning process, financial advisers should attempt to structure estates to hold and transfer assets in the most tax-efficient ways. This could include holding foreign assets and even holding funds in a foreign country to more efficiently provide living and/or business expenses. **Tax avoidance** is legal. **Tax evasion** is hiding, misrepresenting, or otherwise not recognizing income so as to illegally avoid taxation.

Many countries enter into global treaties which provide for the sharing of information. QIs collect all the information required by the United States but provide the information on their U.S. customers only. A similar agreement exists in the European Union, by which EU member banks exchange customer information with each other.

Module Quiz 30.1

1. **B** The primary objectives of estate planning are to minimize taxes and to facilitate the tax-efficient transfer of assets to heirs or recipients of charitable bequests. Diversification and the ability to maximize excess returns are usually not the objectives of estate planning and are part of the grantor's/settlor's investment policy statement while accumulating assets throughout working years and throughout retirement. Note that estate planning also includes decisions to transfer assets before death. (LOS 30.a)

2. **B** All of their estate less any required forced heirship distribution is the most correct answer. Forced heirship and marital rights specify minimums that certain heirs may be entitled to receive. Such rules do not directly set maximums allowed to be passed on to the spouse. (It is true that if others are entitled to specified minimums, the effect may be to indirectly set a maximum it is possible to leave the spouse; however, there is no specified martial maximum for the spouse.) (LOS 30.b)

Module Quiz 30.2

1. A. Joe and Charlene's joint probability of surviving for a given number of years is equal to the sum of their individual probabilities minus the product of their individual probabilities:

p(Joint) = p(Joe survives) + p(Charlene survives) − p(Joe survives)p(Charlene survives)

There is effectively 100% probability (0.99998) at least one of them will survive for one year:

   Year 1 = 0.992 + 0.997 − (0.992)(0.997) = 1.0000

There is 99.98% probability at least one of them will survive for two years:

   Year 2 = 0.982 + 0.987 − (0.982)(0.987) = 0.9998

There is 99.91% probability at least one of them will survive for three years:

   Year 3 = 0.972 + 0.967 − (0.972)(0.967) = 0.9991

Candidate discussion: Part A only asked for year 3, but all three years are needed and used to answer Part B.

B. The capitalized value of the core spending needs is the sum of the product of the joint probability of survival and the real spending need discounted by the real risk-free rate.*

The real risk-free rate is calculated as:

(1 + nominal risk-free rate) / (1 + inflation rate) − 1 = (1.05 / 1.03) − 1 = 1.94%

Year	Spending	Joint p(Survival)	Expected Spending	Discount Factor	Discounted Value
1	80,000	1.0000	80,000	1.0194	$78,478
2	80,000	0.9998	79,984	$(1.0194)^2$	$76,969
3	80,000	0.9991	79,928	$(1.0194)^3$	$75,451

* In this question, the spending needs were given in real terms so the real risk-free rate was used for discounting. If the spending needs had been given in nominal terms, the nominal risk-free rate would have been used for discounting.

(LOS 30.c)

2. **C**   Using Monte Carlo simulation is one approach. MCS can project how long various starting amounts of capital will last. By running multiple simulations, you could determine an acceptable core capital amount that will support needs without taking excessive longevity risk. The morality table approach is also possible, but to do so you either discount projected real needs at the real risk-free rate or nominal needs at the nominal risk-free rate. In either case, you then add a safety reserve to the amount to find required core capital. (LOS 30.c)

Module Quiz 30.3

1. A.   The giver can earn a higher after-tax return of 8.5% versus 6% for the receiver $(8(1-0.25) = 6\%)$. That favors waiting to make a bequest at death if the investment is held in the estate long enough compounding at the higher 8.5%. But giving now avoids any estate tax that could lower the return to less than 6% making giving now more beneficial assuming the gift tax is avoided. The relevant equation is the following:

$$\mathrm{RV}_{\text{tax-free gift}} = \frac{FV_{\text{tax-free gift}}}{FV_{\text{bequest}}} = \frac{\left[1+r_g\left(1-t_{i_g}\right)\right]^n}{\left[1+r_e\left(1-t_{i_e}\right)\right]^n(1-T_e)}$$

Until the time period (n) is known, the optimal solution of gifting now versus making a bequest is unknown.

B.   The giver can earn a higher after-tax return, and waiting to make a bequest will be subject to a lower transfer tax of 30%. Wait and make a bequest.

C.   Gifting now gives up control and the assets cannot be recovered if the giver changes their mind or needs the funds. This may create a reason to wait and make a bequest. (LOS 30.d)

Module Quiz 30.4, 30.5

1. **C**   When an investor makes a charitable gift of appreciated securities, the investor is usually able to avoid gift transfer taxes and can take an income tax deduction equal to the current fair market value of the gift. The appreciated securities continue to avoid capital gains taxes once transferred to the tax-exempt organization. (Module 30.4, LOS 30.d, 30.e, 30.f)

2. **C**   Investments in privately held companies are usually tax-efficient from an estate planning perspective, because they can be transferred after taking a valuation discount. The discount relates to uncertainty of true value as well as lack of liquidity and sometimes control. It is true that they are also tax-efficient from the standpoint that any gains realized are usually taxed at favorable long-term rates, but this pertains to liquidating the assets that would normally not be done before transferring them in an estate. (Module 30.4, LOS 30.f)

3. A.   From a purely financial perspective of maximizing wealth within the family, he will almost certainly use a generation-skipping strategy to dispose of the assets directly to the grandchildren. That way there is only one gift or estate tax, not two.

   The primary non-financial issue to consider is whether his children need some of the funds, in which case some of the money will need to go to them.

   (Note the choice of gift or bequest is determined by calculating an RV ratio and is not the issue in this question.) (Module 30.4, LOS 30.f)

   B.   Place the funds in a trust that will be managed for the benefit of the grandchildren. (This can be called a spendthrift trust.) Discretionary is almost certainly best because the trustee can then make decisions to best meet Johnson's intent for how to take care of the grandchildren.

   Candidate discussion: Both parts of this question are intentionally rather vague and open- ended. The answer represents and assists you in understanding the basic conclusions you should have reached about this topic. (Module 30.4, LOS 30.f)

4. A.   20% of 100 to V = 20 and 30% of 100 to X = 30

   B.   20% of 100 to V = 20 and 30% of (100 – 20) to X = 24

   C.   20% of 100 to V = 20 and 30% of 100 to X = 30. However, he can take a credit of 20 from having already paid 20 in V; therefore, he only owes 10 to X.

   Candidate discussion: Unless clearly directed otherwise, the unstated assumption is the source tax is determined first because in some cases that affects the amount owed for the residence tax. (Module 30.5, LOS 30.k)

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[1]. 2020 CFA Level III curriculum, Exhibit 2, Vol. 5, p. 295.

[2]. The premiums are not usually considered part of the grantor's estate for tax purposes, but in some jurisdictions the premiums are considered gifts to the beneficiary and may be subject to taxation.

READING 31: CONCENTRATED SINGLE-ASSET POSITIONS

EXAM FOCUS

This topic review presumes a basic understanding of taxation, particularly capital gains taxes, along with derivative payoff patterns and features. This background is covered in other sections of the Level III curriculum and is not more than what has already been utilized at Levels I and II. The material takes a global perspective, meaning that legal and tax specifics are not going to be covered. Do not implement these techniques without consulting a qualified, knowledgeable tax and legal advisor. This is a good introduction to a specialized area that would require years of additional experience and training in order to reach proficiency.

INTRODUCTION

Through work, inheritance, entrepreneurship, or for other reasons, individuals may come to hold concentrated positions in a single asset. Concentrated positions in a publicly traded single-stock position, a privately held business, or a real estate investment (not the primary residence) are covered in this discussion. A concentrated position can lead to inefficient asset allocation. An investment manager often works with the client to sell or otherwise monetize the asset. Such decisions often involve illiquidity, tax, legal, and emotional (behavioral finance) issues.

MODULE 31.1: CONCENTRATED SINGLE-ASSET POSITIONS

Video covering this content is available online.

LOS 31.a: Explain investment risks associated with a concentrated position in a single asset and discuss the appropriateness of reducing such risks.

CFA® Program Curriculum, Volume 5, page 340

Concentrated positions can have consequences for return and risk. The assets may not be efficiently priced and, therefore, not generate a fair risk-adjusted return. Illiquid assets can be difficult and costly to exit or non-income producing. The risk in such assets is both systematic and company- or property-specific.

- **Systematic risk** is the risk that cannot be diversified away through holding a portfolio of risky assets. In the single factor CAPM, this would be beta. In multifactor models there will be more than one systematic risk. Multifactor models might include unexpected changes in the business cycle or inflation as systematic risks.

- **Company-specific risk** is the nonsystematic risk of an investment that can be diversified away. It would derive from events that affect a specific investment but not the overall market. A corporate bankruptcy as a result of financial fraud would be an extreme example of company-specific risk. Nonsystematic risk increases the standard deviation of returns without additional expected return. This can be illustrated with a simulation, as shown in the following section.
- **Property-specific risk f**or real estate is the direct counterpart to company-specific risk for a company. It is the additional, diversifiable risk associated with owning a specific property. It might arise, for example, from the discovery of environmental pollution on the site or the loss of a key tenant and rental income.

Simulation Assumptions[1]:

An investor holds an initial portfolio valued at $100 in a single stock with a zero cost basis. The investor can sell the asset and invest the after-tax proceeds in a diversified stock portfolio. In either case, at the end of 20 years, the portfolio is liquidated and any additional taxes are paid.

	Single Stock	Diversified Portfolio
Annual expected return:	10.0%	10.0%
Capital gains tax:	20.0%	20.0%
Dividend:	0.0%	1.2%
Standard deviation:	40.0%	17.0%

Simulation Results:

- Both portfolios have positive skew. Downside is limited to a 100% loss, while the probability of exceeding a 100% gain over a 20-year time horizon is significant.
- The single asset portfolio has more extreme positive skew for two reasons:
  - A higher average ending value reflecting the benefit of tax deferral. The full $100 can be compounded in the single asset portfolio, while selling the stock and reinvesting in the diversified portfolio incurs an initial $20 capital gains tax, allowing only $80 to compound over time.
  - A much higher probability of a 100% loss due to bankruptcy of a single asset.
- The median outcome is higher for the diversified portfolio, reflecting its lower probability of suffering a large or total loss.

The single asset portfolio appears superior when looking at only average ending value. However, when downside risk is considered, the diversified portfolio is superior for most investors.

> **PROFESSOR'S NOTE**
>
> While the situation is somewhat different, this should sound like the conclusion reached in Monte Carlo simulations with path dependency factored in. A diversified portfolio that provides a return consistent with client objectives and constraints is preferable for most clients.

OBJECTIVES IN DEALING WITH A CONCENTRATED POSITION

CFA® Program Curriculum, Volume 5, page 343

There are three common objectives when managing a concentrated position:

1. **Reduce the risk** caused by the wealth concentration.
2. **Generate liquidity** to meet diversification or spending needs.
3. **Optimize tax efficiency** to maximize after-tax ending value.

Reducing the concentrated position is not appropriate for all clients. There are other client specific objectives and constraints to consider:

- **Restrictions on sale.** Stock ownership in a public company may be received by a company executive as part of a compensation package, with company expectations or regulatory requirements that the executive will hold the stock for a certain length of time.
- **A desire for control.** Majority ownership brings control over the business.
- **To create wealth.** An entrepreneur may assume high specific risk in expectation of building the value of the business and his wealth. He may want to begin passing portions of the ownership to key employees as part of an incentive compensation plan or begin to transfer ownership to succeeding generations of the family.
- **The asset may have other uses.** Real estate owned personally could also be a key asset used in another business of the owner.

SPECIAL CONSIDERATIONS IN CONCENTRATED POSITIONS

LOS 31.c: Discuss tax consequences and illiquidity as considerations affecting the management of concentrated positions in publicly traded common shares, privately held businesses, and real estate.

CFA® Program Curriculum, Volume 5, page 344

Sale of a concentrated position may trigger a large capital gains **tax liability**. A large concentrated position is often accumulated and held for many years, resulting in a zero or low tax basis. A plan to defer, reduce, or eliminate the tax may be desirable.

Illiquidity and/or **high transaction** costs can be a factor even if there is no tax due. A public company trading with insufficient volume may require a price discount to sell. The expense of finding a buyer for a private business or real estate can be substantial. The intended use by the prospective buyer may affect the price.

LOS 31.d: Discuss capital market and institutional constraints on an investor's ability to reduce a concentrated position.

CFA® Program Curriculum, Volume 5, page 345

Institutional and capital market constraints such as tax law (covered previously) can significantly affect the costs of selling or monetizing a concentrated position. Legal issues

can depend on the form of asset ownership: sole proprietorship, limited partnership, limited company, or public stock. Other specific issues that may exist include:

■ **Margin lending rules** limit the percentage of the asset's value that can be borrowed. Derivative positions can be used to reduce the risk of the asset position and increase the percentage of value that can be borrowed. Rule-based systems tend to be rigid and define the exact percentage that can be borrowed, while risk-based systems consider the underlying economics of the transaction.

As an example of a rule-based system, the United States generally limits borrowing against a stock to 50% of value even if the stock is hedged with a protective put. However, U.S. regulations classify a prepaid variable forward (which also eliminates downside risk) differently and do not impose margin rules, leaving it up to the lender to decide what will be lent. This is economically inconsistent. A risk-based system would treat both transactions similarly and allow a 100% loan-to-value (LTV) ratio in both cases.

> **PROFESSOR'S NOTE**
>
> A prepaid variable forward is discussed in more detail later. The point here is a rule-based system may ignore the similar results of the two hedging strategies. Remember, this material is not teaching specific laws but warning that such laws are not always logical or self-evident. Surely you know that from studying IFRS and GAAP.

■ **Securities law and regulations** may define the owner as an "insider" (who is presumed to have material, nonpublic information) and impose restrictions, regulations, and reporting requirements on the position.

■ **Contractual restrictions and employer mandates** may impose restrictions (such as minimum holding periods or blackout periods when sales may not be made) beyond those of securities law and regulation.

■ **Capital market limitations** in the form of market structure and regulation can have indirect consequences. Monetization strategies commonly require over-the-counter derivative trades with a dealer to hedge the security's risk and increase the LTV ratio. To offer such trades, dealers must be able to hedge the risks they assume. This may be impossible. For example, if the asset is an initial public offering (IPO) or trades infrequently, there will not be a price history on which the dealer can base a hedge. Borrowing and shorting the underlying asset is often required for the dealer to hedge their risk. This is prohibited in some markets. Without sufficient price history and liquidity in the underlying instruments, monetization techniques may be unavailable.

LOS 31.e: Discuss psychological considerations that may make an investor reluctant to reduce his or her exposure to a concentrated position.

CFA® Program Curriculum, Volume 5, page 347

> **PROFESSOR'S NOTE**
>
> This section repeats material better covered in Behavioral Finance. It reiterates that cognitive biases are generally easier to overcome with education than are emotional biases. Managers may be able to help investors with emotional biases overcome them by asking questions such as: What would you do if the position were cash rather than a single asset? When grandmother left this stock to you, did the shares make more sense to hold? Reviewing past performance and current risk may help the investor gain perspective and think rationally.

Typical cognitive biases include *conservatism* in maintaining existing beliefs; *confirmation* in seeking support for what is already believed; *illusion of control* when the investor believes he can control what will happen to the investment; *anchoring and adjustment* in making decisions in reference to the current position held; and *availability in making decisions* based on ease of recalling information.

Typical emotional biases include *overconfidence, familiarity,* and *illusion of knowledge* leading the investor to overestimate the probability the investment will produce favorable returns; *status quo bias* and a failure to consider making changes; *naive extrapolation* of past results; *endowment* in expecting to be able to sell the asset for more than the investor would pay for it; and *loyalty bias* in retaining employer stock or feeling an obligation to retain an inherited position.

MODULE QUIZ 31.1

To best evaluate your performance, enter your quiz answers online.

1. For which individual would reducing specific risk be *most* appropriate?
   A. An owner who holds 100% of a private business. The position is 40% of his assets.
   B. An executive owning shares of the company where she is employed. The position is 40% of her assets.
   C. The spouse who inherited an investment real estate position. Real estate makes up 10% of the spouse's assets.

2. Which of the following owners of a concentrated position would *most likely* wish to retain control of the position as part of a monetization strategy?
   A. The owner of a rental apartment property.
   B. The owner of a warehouse who leases the building to a private company he owns.
   C. Young children who inherit concentrated positions in public stock of the company where their mother worked and private stock in the company their father founded.

3. Illiquidity is *least likely* a factor in which concentrated position?
   A. Real estate held a couple of years.
   B. A private company acquired at the bottom of a past economic cycle.
   C. Publicly traded shares of stock recently awarded to a company executive.

4. Capital market limitations tend to make monetization strategies more difficult in:
   A. less regulated markets where dealers are able to take long and short positions in a variety of instruments.
   B. highly competitive markets with few barriers to entry or exit and a large number of unregulated dealers.
   C. regulated markets where each dealer is confined to trading specific instruments, allowing them to specialize and offer higher liquidity in a narrower range of products.

5. John Smith owns three apartment buildings. He employees himself as the business manager and pays himself a market wage for this function. Being recently divorced, this job has brought stability to his life. Financially, he does not need the "manager salary," but the job makes him feel better about himself. His advisor points out to Smith that the apartment buildings are exposing Smith to high property-specific risk. Smith agrees and embraces the idea of selling or monetizing the properties. Which of the following behavioral biases is Smith exhibiting and how has the manager addressed the bias? Smith is exhibiting:
   A. a cognitive bias, and the manager educated Smith.
   B. an emotional bias, and the manager educated Smith.
   C. an emotional bias, and the manager accommodated Smith.

MODULE 31.2: GOAL-BASED AND LOCATION

LOS 31.f: Describe advisers' use of goal-based planning in managing concentrated positions.

Video covering this content is available online.

A **goal-based decision process** modifies traditional mean-variance analysis to accommodate the insights of behavioral finance theory. The portfolio is divided into tiers of a pyramid, or **risk buckets**, with each tier or bucket designed to meet progressive levels of client goals. The risk buckets and sequence of priority are:

1. Allocate funds to a **personal risk bucket** to protect the client from poverty or a drastic decline in lifestyle. Low-risk assets such as money market and bank CDs, as well as the personal residence, are held in this bucket. Safety is emphasized, but a below-market return is likely.

2. Next, allocate funds to a **market risk bucket** to maintain the client's existing standard of living. Portfolio assets in this bucket would be allocated to stocks and bonds earning an expected market return.

3. Remaining portfolio funds are allocated to an **aspirational risk bucket** holding positions such as a private business, concentrated stock holdings, real estate investments, and other riskier positions. Allocating these holdings to the aspirational risk bucket highlights their risky nature for the client. If successful, these high-risk investments could substantially improve the client's standard of living.

To implement a goal-based plan, the manager and client must determine the **primary capital** necessary to meet the goals of the first two risk buckets and the amount of any remaining **surplus capital** to meet *aspirational goals*. If a concentrated holding in the aspirational bucket leaves insufficient funds for the first two primary capital buckets, sale or monetization of the concentrated position must be discussed with the client. Some questions to address are:

- What are the client's lifetime spending needs and desires?

- What is the present value of those needs and desires?

- What is the value of the concentrated position and do different approaches to sale or monetization produce different values?

- What other assets does the client have and how liquid are they?

- Would sale or monetization of the concentrated position be sufficient to fund any shortfall in the primary capital?

EXAMPLE 1

Bill Cook is the founder, manager, and 100% owner of a private company. Through hard work he has built his company to an estimated value of GBP 30,000,000. While the country he resides in is not the U.K., it uses the GBP. His tax basis is near zero, and he has been planning for his daughter to take over the business when he retires in 3 years. He was shocked when she recently announced she is quitting the business to pursue a different life course. Both his grandchildren also work at the company and are advancing rapidly in their business skills. Cook has a home (mortgage free) and shorter-term government bonds valued at GBP 900,000. In addition, he has a stock and bond portfolio valued at GBP 1,700,000. He also owns the land and building where his business is located. The land and building are valued at GBP 2,000,000 and are mortgaged for GBP 2,000,000.

1. **Determine** the holdings and value of his three risk buckets.

Answer 1:

- Personal risk bucket of GBP 900,000 composed of the home and short-term bonds.

- Market risk bucket of GBP 1,700,000 composed of the stocks and other bonds.

ASSET LOCATION AND TRANSFER

LOS 31.g: Explain uses of asset location and wealth transfers in managing concentrated positions.

CFA® Program Curriculum, Volume 5, page 353

Asset location determines the method of taxation that will apply. Location in a tax-deferred account would defer all taxes to a future date. In a taxable account, interest, dividends, and capital gains may be subject to different tax rates (or deferral possibilities in the case of when to realize capital gains). If the concentrated position owner has control over the asset, other tax strategies to maximize after-tax ending wealth will be discussed.

Wealth transfer involves estate planning and gifting to dispose of excess wealth. The specific strategies used depend on the tax laws of the country and the owner's situation. Key considerations include:

1. Advisors can have the greatest impact by working with clients before significant unrealized gains occur. If there are no unrealized gains, there are generally no financial limitations on disposing of the concentrated position.

2. Donating assets with unrealized gains to charity is generally tax-free even if there are gains.

3. An **estate tax freeze** is a strategy to transfer future appreciation and tax liability to a future generation. This strategy usually involves a partnership or corporate structure. A gift tax would be due on the value of the asset when the transfer is made; however, the asset (including any future appreciation in value) will be exempt from future estate and gift taxes in the giver's estate. Any tax owed is "frozen," meaning paid or fixed near an initial value.

and the common stock is worth GBP 0. Cook is advised to gift the common stock to a trust that will later disburse the stock to his grandchildren.

1. Assuming this transaction functions as an estate tax freeze, **explain** how it affects Cook's current and future tax situation as well as his other goals.

Answer 1:

The common stock has no current value, so there should be no tax on the initial gift. The preferred stock (with a fixed dividend) is not expected to increase in value as the company grows. The preferred stock will still be in Cook's estate and subject to taxes but at a value that is "frozen." Future growth of the business should increase the value of the common stock, which is not part of Cook's portfolio or estate. It will be taxed in the trust.

By retaining the voting preferred stock, Cook continues to have sole control of the business and can work there as long as he wishes. His cost basis is still zero, and he has a substantial unrealized gain in the preferred stock.

2. Cook is concerned that this strategy is overly complicated and is considering just giving ownership of the company to his grandchildren now. He will keep working for a few more years and, by then, they will be ready to take over. **Evaluate** whether this strategy is more appropriate than the estate tax freeze.

Answer 2:

This is less appropriate. While it is simple, a tax bill on the GBP 30,000,000 will be due immediately. In addition, Cook would no longer control the company. The grandchildren would have control, and there is no assurance they are currently ready to run the business. Cook will have no assurance he can continue to work there until retirement.

Minimizing transfer tax costs is more difficult when gains already exist. In the Cook example, the estate tax freeze shifts taxation of future appreciation but not of the existing gain.

Establishing a limited partnership and gifting may reduce taxes on existing appreciation. Cook could establish a limited partnership to hold the business and serve as general partner while gifting the limited partnership interests to his grandchildren. The partnership will own the business and, as general partner, Cook will make all business decisions. The tax value of the limited partnership interests can be reduced for gift taxes because they lack marketability and control. A total discount of 30% to 60% is plausible. Future appreciation in the value of the limited partnership positions would be taxed to the limited partners rather than Cook, moving the tax burden on future appreciation to the limited partners.

A five-step process can be used to make decisions for managing a concentrated position:

Step 1: Establish written objectives and constraints for the client. Nonfinancial issues such as retaining control of the asset and wealth transfer goals should be included in the document.

Step 2: Identify the techniques and strategies that best meet these objectives and constraints.

Step 3: Consider the tax advantages and disadvantages of each technique.

Step 4: Consider the other advantages and disadvantages of each technique.

Step 5: Document the decisions made.

MODULE QUIZ 31.2

To best evaluate your performance, enter your quiz answers online.

1. An investor owns a personal residence worth $1,000,000 and mortgaged for $700,000, a warehouse worth $3,000,000 and mortgaged for $2,000,000, a private business worth $6,000,000, a savings account of $150,000, and a stock and bond portfolio of $6,000,000. The present value of the investor's primary and secondary objectives are $6 and $4 million, respectively. Based on this information, the investor's advisor should:

A. suggest monetizing the home.
B. suggest selling the personal business.
C. not recommend monetizing the home or selling the personal business.

2. The primary purpose of an estate tax freeze is to:
   A. minimize total taxes paid.
   B. minimize taxes currently due.
   C. shift the tax burden from the current owner of an asset.

MODULE 31.3: STRATEGIES FOR COMMON STOCK

Video covering this content is available online.

Three broad techniques can be used to manage concentrated positions:

- **Sell the asset:** This will trigger a tax liability and loss of control.
- **Monetize the asset:** Borrow against its value and use the loan proceeds to accomplish client objectives.
- **Hedge the asset value:** Often done using derivatives to limit downside risk.

Hedging techniques often utilize over-the-counter (OTC) or exchange-traded derivatives. The choice of OTC instruments will (1) create counterparty credit risk, and (2) provide flexibility in setting the specific terms of the instrument. In contrast, exchange-traded instruments (1) facilitate closing the transaction early by entering an offsetting transaction, (2) provide price discovery because transaction prices are publicly reported, and (3) provide more transparent fees and transaction costs because it is easier for a dealer to embed transaction costs in complex OTC derivatives.

> **PROFESSOR'S NOTE**
>
> We are going to follow the CFA curriculum and proceed through a variety of techniques that might be applicable for a given client. There is a chance a question will describe applicable tax or legal issues and then require comment on whether a specific strategy would be appropriate based on the information presented in the case.
>
> It bothers some candidates that tax and legal issues do not always make economic sense, may be inconsistent (the same economic result is treated differently) within a country or between countries, and that the CFA text does not cover the specifics of how a transaction will be taxed. The curriculum points out this should not be surprising. Generally market participants "invent" a strategy or technique to accomplish a goal such as maximizing after-tax value. Regulators in each country then attempt to determine which rules to apply or write new rules to apply to the transaction. The results can be inconsistent in hindsight. The curriculum cannot cover specifics that vary by country or regulator and over time.

MANAGING CONCENTRATED STOCK POSITIONS

LOS 31.h: Describe strategies for managing concentrated positions in publicly traded common shares.

CFA® Program Curriculum, Volume 5, page 356

Monetization generally involves receiving cash for a position without triggering a tax event. It is a two-step process:

Step 1: Hedge a large part of the risk in the position. This is often complicated by tax regulations. If a perfect hedge removes all risk, it may be taxed as a sale. The hedge must be structured to eliminate as much risk as possible without the tax liability coming due.

Step 2: Borrow using the hedged position as collateral. The more effective the hedge, the higher the loan to value (LTV) ratio for the loan. For example, if a highly effective hedge can be established that limits the decline in value of a $10 million position to 5% (a $9.5 million ending value), it may now be possible to borrow $9.5 million (95% of initial LTV). The client can then use the $9.5 million to meet portfolio objectives.

To illustrate potential monetization tools, consider an investor with 100,000 shares of PBL, which is trading for $50 per share. Four tools can be considered for hedging the asset. They differ in how they hedge the asset, but all are designed to reduce the risk and increase the funds available to the investor.

1. **Short sale against the box**. The investor borrows 100,000 shares of PBL and sells them short. The investor is long and short the stock, a "riskless position" that is expected to earn the risk-free rate of return. The investor can use the short sale proceeds to meet portfolio objectives. Alternatively, regulations may require the investor to hold the short sale cash proceeds in an account to collateralize the short sale, but the investor could use that account as collateral to borrow close to 100% LTV of the hedged position.

2. **Equity forward sale contract**. The investor enters a forward contract to sell the 100,000 shares of PBL. The investor has a known sale price and does not share in any upside or downside price movement of PBL from that contract price.

3. **Forward conversion with options**. A pair of options is used to hedge the stock position, selling calls and buying puts with the same strike price. If a $50 strike price is used and the stock rises above $50, it will be called; if the stock falls below $50, it can be put. A hedged ending value of $50 is established.

4. **Total return equity swap**. The investor enters a swap to pay the total return on the $5,000,000 of PBL and receives LIBOR. The investor is fully hedged. If the return of PBL exceeds LIBOR, the investor pays the difference, which eliminates any gains on PBL. If the return of PBL is less than LIBOR, the investor receives the difference, so his return is LIBOR.

Selecting the tool will depend on tax treatment. The goal is to select the tool that will not trigger an existing tax liability. Critical questions will include what happens when a derivative is executed or closed, how the gains or losses are taxed, what expenses are involved, and the effects on the concentrated position.

It is also possible to use **modified hedging** to minimize downside risk while retaining upside in the underlying position. The following continues the discussion of the investor with 100,000 PBL shares.

Protective puts (sometimes called **portfolio insurance**): The investor would purchase puts on 100,000 shares of PBL. An at-the-money put with a strike price of $50 might cost $4.57 per share and protect against any decline if the price falls below $50. An out-of-the-money (OTM) put with a strike price of $48 might cost $2.98 per share. By using the OTM put, the investor is *self-insuring* the first $2 of stock price decline, but the OTM put will cost less initially. In all cases the options are a *wasting asset* that will be worthless if they expire out-of-the-money.

There are several ways to lower the cost of the protection:

- Purchase an out-of-the-money put as just described.

- Buy a put with a shorter time to expiration. The protection lasts for less time and will cost less.
- Use a pair of puts, buying a put with a higher strike price of X_H and selling a put with a lower strike price of X_L. Buying a put with a strike price of $48 protects against price declines below $48 but selling a put with a strike price of $40 removes any protection below that price. The investor is protected between X_H and X_L. The sale of puts reduces the initial cost.
- Add exotic features to the option (not found in standard options). For example, a **knock-out put** expires prior to its stated expiration if the stock price rises above a specified level. This may reduce the protection, and the option will cost less.
- **No-cost** or **zero-premium collars** are a common way to lower initial cost, in this case to zero, by giving up some stock upside. A put is purchased and a call is sold with different strike prices selected so the premiums are equal. For PBL, the investor could buy the 48 put for $2.98 and sell a 53 call for $2.98. The investor has a net expenditure of $0. The investor is protected if the stock price falls below 48, but the stock will be called at 53 if its price rises to that level. To increase the upside of the strategy, a call with a higher strike price can be sold. It will cost less, but to maintain the initial zero cost, a put with a lower strike price must be purchased. The upside potential is increased, but the downside protection is reduced.

PROFESSOR'S NOTE

This CFA material assumes you remember the basics of options and forward contract payoffs. These same basics are also important in the derivatives and currency sections of the curriculum. We review the important basics in derivatives. Candidates may benefit by reviewing this section after the derivatives Study Session.

The reason complex and multiple structures are presented is to leave enough risk and uncertainty so that the transaction is not treated as equivalent to a sale for tax purposes.

Prepaid variable forwards (PVF) are economically similar to a collar and loan in one transaction. The owner of 100,000 PBL shares (currently priced at $50) could enter a PVF with a dealer. The dealer would pay the owner $45 per share now, equivalent to borrowing $45 per share. The loan will be repaid by delivering shares of PBL at a future date. The PVF could specify delivery of all 100,000 shares if PBL is below $50 per share on the repayment date but require delivery of a smaller number of shares if the price of PBL rises above $50.

PROFESSOR'S NOTE

PVFs are considered "exotic" OTC instruments. The specifics of any contract vary. In this case the owner receives cash at initiation of the PVF, has a minimum sale price of $45 per share, and retains some price upside because fewer than 100,000 shares may be needed to close the PVF. The CFA text covers the concept of a PVF but not its details.

EXAMPLE 3

An investor holds 50,000 shares valued at $100 per share. The investor simultaneously buys an OTC European style 6-month put with a strike price of 97 and sells a 1-year exchange-traded American style call with a strike price of 105. Both options cover the 50,000 shares, and the option premiums are equal. The relevant tax code specifies that option premiums received are taxed as ordinary income (t = 30%). Option premiums paid increase the tax basis of the underlying holding. In this case the underlying position is a long-term holding, and any gain will be taxed at 10% when realized.

1. **Comment** on whether this structure is more like a prepaid variable forward (PVF) or a zero cost collar (ZCC). Also, **comment** on how the risks in this transaction differ from a typical PVF or ZCC.

TAX CONSIDERATIONS IN STRATEGY SELECTION

LOS 31.i: Discuss tax considerations in the choice of hedging strategy.

CFA® Program Curriculum, Volume 5, page 368

Example 3 described a **mismatch in character**, two items in a strategy that trigger different tax treatments. In that case it was the option premium received now and taxed at 30% versus a future reduction in long-term gain that would be taxed at 10%. A hedging strategy needs to consider any mismatch and select the tool or strategy that maximizes after-tax value for the investor.

Many tax codes treat employer stock options as an alternative to salary and tax any gains on the options as ordinary income. Hedging the options could produce a mismatch in character. As an example, a gain on stock options of $100,000 is taxed as ordinary income at 30%, while offsetting losses of $100,000 on the derivatives hedge are used to reduce long-term gains that are taxed at 10%. The tax of $30,000 is reduced by only $10,000 of capital gains tax not paid and only if the investor has $100,000 of capital gains to shelter. Whatever the strategy, it is essential to verify how it will be treated for tax purposes.

Yield enhancement with **covered calls** is another potential strategy. The owner of 100,000 shares of PBL priced at 50 could sell call options with a strike price of 53 for $2.98 a share. Because the stock will be called away if the price rises above $53, the owner is predetermining a liquidation value of $53. A manager could use a covered call program on a portion of the holding to psychologically prepare an investor to gradually reduce the concentrated position. The $2.98 of premium income received can be viewed as either enhancing the income yield of the stock or protecting against the first $2.98 of stock price decline.

Two **tax-optimization equity strategies** combine tax planning with investment strategy.

1. **Index tracking with active tax management**. Cash from a monetized concentrated stock position is invested to track a broad market index on a pretax basis and outperform the index on an after-tax basis. For example, if dividends are taxed at a higher rate than capital gains, the tracking portfolio could be structured with a lower dividend yield but higher expected price appreciation.

2. **A completeness portfolio** structures the other portfolio assets for greatest diversification benefit to complement (complete) the concentrated position. For example, if the concentrated position is an auto stock, the rest of the assets are selected to have low correlation with auto stocks such that the resulting total portfolio better tracks the return of the chosen benchmark.

Both of these tax-optimization strategies allow the investor to retain ownership of the concentrated position but may take time and sufficient other assets and funds to implement. (Tracking cannot be greatly improved if the investor has $9 million in the auto stock and $1 million of other assets.) Both strategies provide diversification while deferring the gain.

A perfect hedge is generally inappropriate if it will cause the underlying gain to be taxed or if the necessary derivatives do not exist. A **cross hedge** may be used instead. The investor who holds a large position in an auto stock but finds it cannot be shorted to create a hedge could consider three cross hedge possibilities:

1. Short shares of a different auto stock or another stock that is highly correlated with the concentrated position. The highly correlated short position will increase (decrease) in value to offset decreases (increases) in the auto stock.

2. Short an index that is highly correlated with the concentrated position. Shorting a different stock or an index will introduce company-specific risk. A negative event could affect the concentrated position but have no offsetting effect on the value of the short position.

3. Purchasing puts on the concentrated position is also considered a cross-hedge in that the put and stock are different types of assets.

Exchange funds are another possibility. Consider 10 investors, each of whom has a concentrated position in a single stock with a low cost basis. Each investor's position is in a different stock. The investors contribute their holdings into a newly formed exchange fund, and each now owns a pro rata share of the new fund. If investor H had a position worth EUR 5,000,000 with a cost basis of EUR 500,000 and the total value of the new fund is EUR 100,000,000, she now owns 5% of the new fund at a cost basis of EUR 500,000. The investor now participates in a diversified portfolio and defers any tax event until shares of the fund are sold.

MODULE QUIZ 31.3

To best evaluate your performance, enter your quiz answers online.

1. A prepaid variable forward is economically *most* similar to a:
    A. collar.
    B. protective put.
    C. covered call writing program.

2. An investor seeking to hedge a stock position executes appropriate at-the-money call and put options. Premiums paid are SFR 100,000 and received are SFR 70,000. The investor's country taxes option premiums received as income at 40%, while option premiums paid increase the cost basis of the underlying. Realized capital gains are taxed at 10%. What is the effect on the investor's current-period tax return based only on the information provided and assuming the asset is not sold in this period?
    A. SFR 12,000.
    B. SFR 28,000.
    C. SFR 40,000.

MODULE 31.4: PRIVATE BUSINESSES AND REAL ESTATE

LOS 31.j: Describe strategies for managing concentrated positions in privately held businesses.

CFA® Program Curriculum, Volume 5, page 372

The previous strategy discussions will apply if the instruments necessary to implement a strategy exist. However, privately held businesses may be more concentrated (the owner could own 100% of the business and it may be close to 100% of her assets), the standalone and nonsystematic risk tends to be very high, and the asset is generally illiquid. Noninvestment psychological issues are often significant. The owner may derive a large part of his sense of self-worth as well as his income from the business. Business and personal life are often intermixed. If the concentrated position was received from a family member, there can be a strong sense of attachment to the holding.

Exit strategies for the business must be considered. Exit strategies include monetization, sale, a phased sale over time, or an adjustment to the business structure that will provide the owner with cash. Exit strategy analysis should consider:

- The value of the business.
- Tax rates that would apply to the potential exit strategies.
- Availability and terms of credit, as borrowing may be involved in financing any transaction.
- The buying power of potential purchasers.
- Currency values if the transaction involves foreign currencies.

The strategies to consider in managing a private business position include:

- **Strategic buyers** take a buy and hold perspective and generally offer the highest price to the seller. Strategic buyers seek to combine the business with an existing business of the buyer.
- A **financial buyer** or a **financial sponsor** is often a private equity fund planning to restructure the business, add value, and resell the business (typically in a 3 to 5 year period). They generally purchase more mature, established businesses and offer a lower price than a strategic buyer.
- **Recapitalization** is generally used for established but less mature (middle market) companies. In a **leveraged recapitalization** the owner may retain 20% to 40% of the equity capital and sell 60% to 80% of his shares back to the company. The owner continues to manage the business with a significant financial stake. A private equity firm could arrange the financing for the company to purchase the owner's stock. In exchange, the private equity firm receives equity in the company. This could be part of a *phased exit strategy* for the owner; sell and receive cash for a portion of his equity in the initial transaction, then participate in and sell his remaining shares when the private equity firm resells their position in a few years. Taxes are owed on the cash received in the initial recapitalization, but additional taxes are deferred until the owner's remaining stock is sold. If tax rates are expected to increase in the future, the transaction can be structured with more cash in the initial transaction.

- In a **sale to (other) management or key employees**, the owner sells his position to existing employees of the company. There are drawbacks:
  - Generally the buyers will only purchase at a discounted price.
  - The buyers may lack financial resources and expect the existing owner to finance a significant portion of the purchase with a loan or a promissory note, which is a promise that the buyers will pay in the future.
  - The promissory note is often contingent on future performance of the business with no assurance current employees or managers are capable of running the business and making the payments. This structure may be called a management buyout obligation (MBO) because existing managers buy the business in exchange for an obligation to pay for the business in the future.
  - Negotiation with employees to sell the business to them may fail and damage the continuing employer/employee relationship needed to continue operating the business.
- In a **divestiture, sale, or disposition of non-core business assets**, the owner sells nonessential business assets and then directs the company to use the proceeds to pay a large dividend to, or repurchase stock from, the owner. In either case, the owner receives cash while retaining the rest of the stock and control of the business.
- A **sale or gift to family members** could be structured with tax advantages such as the estate tax freeze or limited partnership valuation discounts discussed earlier. If the family members lack the financial resources to pay cash, the existing owner could do an MBO and accept a promissory note for the purchase price. Unfortunately, neither a gift nor MBO sale provides the existing owner much immediate cash flow.
- A **personal line of credit secured by company shares**. The owner can borrow from the company and pledge her company stock as collateral. If the company does not have the financial resources to make the loan, the company could borrow to obtain the cash for the loan to the owner. Interest paid by the company can be a tax-deductible business expense. Alternatively, the line of credit (loan to the owner) could be from a third-party lender. The company may offer the lender a put, allowing the lender to transfer the loan to the company for cash. This increases the lender's assurance of repayment in exchange for more favorable loan terms to the owner.
- With an **initial public offering (IPO)** the owner sells a portion of his shares to the public and transforms the remaining shares into liquid public shares. Generally, IPO purchasers will expect the owner to retain a significant ownership stake and continue to manage the business. The existing owner now faces the increased scrutiny of running a public company.
- With an **employee stock ownership plan (ESOP)**, the owner sells stock to the ESOP, which in turn sells the shares to company employees. In a leveraged ESOP, the company borrows the money to finance the stock purchase. In the United States (subject to additional restrictions), the owner's sale of shares may not trigger a capital gains tax.

EVALUATING THE STRATEGIES

EXAMPLE 4

1. We previously considered the Bill Cook case. Cook has taken no actions regarding his ownership of a private company. His health has seriously deteriorated and is not expected to improve, but the company has thrived. Cook believes the company is worth "at least GBP 50 million." He wishes to retire next year and is now highly motivated to find the cash to fund a diversified portfolio of liquid stocks and bonds that will support his retirement and meet his medical expenses. He is no longer concerned with passing the company to family members.

   He is considering several alternatives:

   A. Sell 100% of the company to a strategic buyer for GBP 48 million.

   B. Sell 100% to a financial buyer for GBP 46 million.

   C. Sell 100% of the company to the existing employees in an MBO for GBP 50 million. Cook will receive GBP 4 million up front, accept a GBP 25 million promissory note from the employees payable in equal installments over 10 years at 0% interest, and the balance in a note at 4% interest that will pay if the company meets defined future performance targets. Default on payments returns the company to Cook.

   D. Gift the business to his grandchildren.

   Recommend the best alternative for Cook and support your decision with two reasons specific to Cook's objectives. **Give** one drawback to the recommended strategy. For each alternative not recommended, **give** one reason it is not appropriate.

Answer 1:

The strategic buyer (A) is best. (1) Cook receives the most cash to fund a diversified portfolio. (2) He is completely out of the business and can concentrate on his health and retirement.

The primary disadvantage is that the sale will trigger a capital gains tax liability.

Alternatives not selected: (B) The financial buyer from Cook's perspective is identical to the strategic buyer but pays less. (C) The MBO price is higher but misleading. It provides minimal up-front cash, and the future payments are not certain. In addition, Cook could end up having to go back to running the company. (D) Gifting provides no money to Cook to meet his objectives.

2. The previous strategic and financial buyers withdraw their offers, and Cook negotiates to sell 85% of the company to a private equity fund for GBP 44 million. Cook will retire and no longer work for the company or have any further authority. He will receive 90% of the GBP 44 million in cash and 10% in a promissory note payable in five annual installments (0% interest) starting in 2 years. The private equity company's exit strategy is to sell the company to a strategic or financial buyer in 3 to 5 years. Cook's remaining shares will be included in that sale.

   Assuming Cook's tax basis is zero and tax is due when cash is received at a 12% long-term gains rate, **calculate** Cook's first-year tax bill. **Discuss** any tax deferral benefits of the transaction to Cook.

Answer 2:

Cook's cash received in the first year is 90% of GBP 44 million, which is GBP 39.6 million. With a zero cost basis, the full GBP 39.6 million is taxable at 12% for GBP 4.752 million in taxes due the first year.

There is some deferral benefit because taxes owed on the remaining 10% of GBP 44 million will be due as the promissory note payments are received. The tax on the remaining 15% of the company owned by Cook will be due when the private equity company makes a subsequent sale, anticipated in 3 to 5 years.

3. How does this transaction change Cook's allocation between primary and surplus capital? How does it change his exposure to nonsystematic and total risk?

Answer 3:

After tax, Cook has 44 − 4.752 or GBP 39.248 million more in primary capital that can be used to build a diversified portfolio to support his objectives. Cook lowers his nonsystematic risk as he shifts funds from a concentrated private company to a diversified portfolio of marketable securities. His total risk, measured as standard deviation of the portfolio, should decline.

MANAGING CONCENTRATED INVESTMENT REAL ESTATE POSITIONS

LOS 31.k: Describe strategies for managing concentrated positions in real estate.

A single investment in a real estate asset can be large and constitute a significant portion of an investor's assets, bringing a high level of concentrated, property-specific risk. Real estate is generally illiquid and, if held for a long time, may have a significant unrealized taxable gain. A seller considering sale or monetization of a property should consider its current value relative to historical and expected value in the future, taxes on any transaction, availability of credit, and interest rate levels. Strategies to consider include:

- **Mortgage financing** can be an attractive strategy to raise funds without loss of control of the property. With a **nonrecourse loan** the lender's only recourse is to seize the property if the loan is not paid. The borrower effectively has a put option on the property. If the property value falls below the loan amount, the borrower can default on the loan, keep the loan proceeds, and "put" the property to the lender. A loan on income-producing property could have a zero cash flow effect on the borrower if the property's income covers the interest on the loan and other property expenses.

- A **donor-advised fund** or **charitable trust** can allow the property owner to take a tax deduction, gift more money to the charity, and influence the use of the donation. For example, an investor owns property worth $5,000,000 and would like to make a $5,000,000 contribution to a local hospital in exchange for having a new children's clinic named after his mother. The property was originally purchased for $3,000,000 and the investor has deducted $1,300,000 in depreciation expense, making the current tax basis $1.7 million. If sold for $5,000,000, the owner would owe gains taxes of 15% on a $2,000,000 capital gain and recapture taxes of 12% on $1,300,000. Instead the owner can contribute the property to a donor advised fund for the hospital, take a $5,000,000 tax deduction, and the tax-exempt hospital can sell or retain the property with no tax due. The gains and depreciation recapture are never taxed.

- A **sale and leaseback** can provide immediate funds while retaining use of the property. For example, a small business owner also owns a warehouse that he uses in his business. The owner sells the warehouse to a financial buyer who leases the warehouse to the business for 10 years with an option for the business to renew the lease for another 10 years. The sale price is 100% of fair market value. The owner secures funds to meet portfolio objectives, and his business retains use of a key asset. The rental payments on the lease are a deductible business expense.

MODULE QUIZ 31.4

To best evaluate your performance, enter your quiz answers online.

1. The primary issue for a manager advising the holder of a concentrated position in a private business versus in a public company is determining:
    A. the investment's value.
    B. the relevant tax rates to apply.
    C. evaluating the impact of currency values.

2. The owner of a factory building who executes a sale and lease back has *most likely*:
    A. lost control of the property.
    B. effectively bought a protective put on the property.
    C. triggered a tax liability based on the present value of the transaction.

MODULE 31.5: COMPREHENSIVE EXAMPLE

Video covering
this content is

LOS 31.l: Evaluate and recommend techniques for tax efficiently managing the risks of concentrated positions in publicly traded common stock, privately held businesses, and real estate.

CFA® Program Curriculum, Volume 5, page 356

Many other strategies and combinations of strategies are possible to deal with concentrated asset positions in public or private equity and investment real estate. This final LOS refers to the entire topic and the examples and illustrations found throughout. Questions presume you understand the basic ideas, terminology, and tax calculations covered here. Any specific question has to provide necessary details, tax rules, rates, and specifics needed to solve the question. Don't forget to consider the psychological and nonfinancial issues often associated with these positions.

MODULE QUIZ 31.5

To best evaluate your performance, enter your quiz answers online.

The following question has three parts for a total of 18 minutes.

Patricia and Steve Peters meet with their advisor to discuss financial goals in retirement. The Peters are both age 54. Steve is the president and sole owner of a private company he founded 15 years ago. They have prepared a list of goals to discuss:

- Steve plans to retire in one year. He wants to make a clean break from the business with no more responsibility. Instead, he will focus on charity work and travel with his wife.
- Within the next several years the Peters want to gift 10% of their wealth to a charity for disadvantaged children.
- Steve estimates his company is worth at least $45 million and has no doubt it will grow in the future, just as it has in the past. His cost basis is $4 million, and capital gains tax rates are 20%. The company pays no dividend.
- Their only other asset is a $5 million diversified stock portfolio.
- Their primary goal is to maintain their standard of living, and their advisor estimates this will require $25 million in assets today.

1. **Discuss** three potential problems in meeting their goals and related to the business Steve owns.

(6 minutes)

2. The Peters ask their advisor to consider several potential ways to monetize the business. In specific, they are interested in (1) an employee buyout, 70% funded by Steve, with the firm's middle management team, (2) a leveraged recapitalization with a private equity firm to purchase 60% of Steve's equity, or (3) a sale to a financial buyer. Which strategy is most plausible given their objectives? **Assume** each transaction has the same value for the entire firm. **Explain** why.

(4 minutes)

3. Patricia asks the advisor to explain a short sale against the box and an exchange fund. **Explain** each briefly and **determine** which might be most suitable for the Peters.

(8 minutes)

LOS 31.a

Concentrated positions can have consequences for return and risk. The assets may not be efficiently priced and, therefore, not generate a fair risk-adjusted return. Illiquid assets can be difficult and costly to exit or non-income producing. The risk in such assets is both systematic and company- or property-specific.

- **Systematic risk** is the risk that cannot be diversified away through holding a portfolio of risky assets. In the single factor CAPM, this would be beta. In multifactor models there will be more than one systematic risk.

- **Company-specific risk** is the nonsystematic risk of an investment that can be diversified away. It would derive from events that affect a specific investment but not the overall market. A corporate bankruptcy as a result of financial fraud would be an extreme example of company-specific risk. Nonsystematic risk increases the standard deviation of returns without additional expected return.

- **Property-specific risk** for real estate is the direct counterpart to company-specific risk for a company. It is the additional, diversifiable risk associated with owning a specific property.

LOS 31.b

There are three common objectives when managing a concentrated position:

1. **Reduce the risk** caused by the wealth concentration.
2. **Generate liquidity** to meet diversification or spending needs.
3. **Optimize tax efficiency** to maximize after-tax ending value.

Reducing the concentrated position is not appropriate for all clients. There are other client specific objectives and constraints to consider:

- **Restrictions on sale**. Stock ownership in a public company may be received by a company executive as part of a compensation package, with company expectations or regulatory requirements that the executive will hold the stock for a certain length of time.

- **A desire for control.** Majority ownership brings control over the business.

- **To create wealth.** An entrepreneur may assume high specific risk in expectation of building the value of the business and his wealth.

- **The asset may have other uses.** Real estate owned personally could also be a key asset used in another business of the owner.

LOS 31.c

Sale of a concentrated position may trigger a large capital gains **tax liability**. A large concentrated position is often accumulated and held for many years, resulting in a zero or low tax basis. A plan to defer, reduce, or eliminate the tax may be desirable.

Illiquidity and/or **high transaction** costs can be a factor even if there is no tax due. A public company trading with insufficient volume may require a price discount to sell. The expense

of finding a buyer for a private business or real estate can be substantial. The intended use by the prospective buyer may affect the price.

LOS 31.d

Institutional and capital market constraints such as tax law can significantly affect the costs of selling or monetizing a concentrated position. Legal issues can depend on the form of asset ownership: sole proprietorship, limited partnership, limited company, or public stock. Other specific issues that may exist include:

- **Margin lending rules** limit the percentage of the asset's value that can be borrowed. Derivative positions can be used to reduce the risk of the asset position and increase the percentage of value that can be borrowed. Rule-based systems tend to be rigid and define the exact percentage that can be borrowed, while risk-based systems consider the underlying economics of the transaction.

- **Securities law and regulations** may define the owner as an "insider" (who is presumed to have material, nonpublic information) and impose restrictions, regulations, and reporting requirements on the position.

- **Contractual restrictions and employer mandates** may impose restrictions (such as minimum holding periods or blackout periods when sales may not be made) beyond those of securities law and regulation.

- **Capital market limitations** in the form of market structure and regulation can have indirect consequences. Monetization strategies commonly require over-the-counter derivative trades with a dealer to hedge the security's risk and increase the LTV ratio. To offer such trades, dealers must be able to hedge the risks they assume. This may be impossible. For example, if the asset is an initial public offering (IPO) or trades infrequently, there will not be a price history on which the dealer can base a hedge. Borrowing and shorting the underlying asset is often required for the dealer to hedge their risk. This is prohibited in some markets.

LOS 31.e

Cognitive biases are generally easier to overcome with education than are emotional biases.

Typical cognitive biases include conservatism in maintaining existing beliefs; confirmation in seeking support for what is already believed; illusion of control when the investor believes he can control what will happen to the investment; anchoring and adjustment in making decisions in reference to the current position held; and availability in making decisions based on ease of recalling information.

Typical emotional biases include overconfidence, familiarity, and illusion of knowledge leading the investor to overestimate the probability the investment will produce favorable returns; status quo bias and a failure to consider making changes; naive extrapolation of past results; endowment in expecting to be able to sell the asset for more than the investor would pay for it; and loyalty bias in retaining employer stock or feeling an obligation to retain an inherited position.

LOS 31.f

A **goal-based decision process** modifies traditional mean-variance analysis to accommodate the insights of behavioral finance theory. The portfolio is divided into tiers of a pyramid, or **risk buckets**, with each tier or bucket designed to meet progressive levels of client goals.

1. Allocate funds to a **personal risk bucket** to protect the client from poverty or a drastic decline in lifestyle. Low-risk assets such as money market and bank CDs, as well as the personal residence, are held in this bucket. Safety is emphasized, but a below-market return is likely.

2. Next, allocate funds to a **market risk bucket** to maintain the client's existing standard of living. Portfolio assets in this bucket would be allocated to stocks and bonds earning an expected market return.

3. Remaining portfolio funds are allocated to an **aspirational risk bucket** holding positions such as a private business, concentrated stock holdings, real estate investments, and other riskier positions. If successful, these high-risk investments could substantially improve the client's standard of living.

To implement a goal-based plan, the manager and client must determine the **primary capital** necessary to meet the goals of the first two risk buckets and the amount of any remaining **surplus capital** to meet aspirational goals. If a concentrated holding in the aspirational bucket leaves insufficient funds for the first two primary capital buckets, sale or monetization of the concentrated position must be discussed with the client.

LOS 31.g

Asset location determines the method of taxation that will apply. Location in a tax-deferred account would defer all taxes to a future date. In a taxable account, interest, dividends, and capital gains may be subject to different tax rates (or deferral possibilities in the case of when to realize capital gains).

Wealth transfer involves estate planning and gifting to dispose of excess wealth. The specific strategies used depend on the tax laws of the country and the owner's situation. Key considerations include:

1. Advisors can have the greatest impact by working with clients before significant unrealized gains occur. If there are no unrealized gains, there are generally no financial limitations on disposing of the concentrated position.

2. Donating assets with unrealized gains to charity is generally tax-free even if there are gains.

3. An **estate tax freeze** is a strategy to transfer future appreciation and tax liability to a future generation. This strategy usually involves a partnership or corporate structure. A gift tax would be due on the value of the asset when the transfer is made; however, the asset (including any future appreciation in value) will be exempt from future estate and gift taxes in the giver's estate. Any tax owed is "frozen," meaning paid or fixed near an initial value.

A five-step process can be used to make decisions for managing a concentrated position:

Step 1: Establish written objectives and constraints for the client. Nonfinancial issues such as retaining control of the asset and wealth transfer goals should be included in the document.

Step 2: Identify the techniques and strategies that best meet these objectives and constraints.

Step 3: Consider the tax advantages and disadvantages of each technique.

Step 4: Consider the other advantages and disadvantages of each technique.

Step 5: Document the decisions made.

Three broad techniques can be used to manage concentrated positions:

- **Sell the asset:** This will trigger a tax liability and loss of control.
- **Monetize the asset:** Borrow against its value and use the loan proceeds to accomplish client objectives.
- **Hedge the asset value:** Often done using derivatives to limit downside risk.

Hedging techniques often utilize over-the-counter (OTC) or exchange-traded derivatives.

LOS 31.h

Monetization generally involves receiving cash for a position without triggering a tax event. It is a two-step process:

Step 1: Hedge a large part of the risk in the position. This is often complicated by tax regulations.

Step 2: Borrow using the hedged position as collateral. The more effective the hedge, the higher the loan to value (LTV) ratio for the loan.

To illustrate potential monetization tools, consider an investor with 100,000 shares of PBL, which is trading for $50 per share. Four tools can be considered for hedging the asset.

1. **Short sale against the box.** The investor borrows 100,000 shares of PBL and sells them short. The investor is long and short the stock, a "riskless position" that is expected to earn the risk-free rate of return. The investor can use the short sale proceeds to meet portfolio objectives.
2. **Equity forward sale contract.** The investor enters a forward contract to sell the 100,000 shares of PBL. The investor has a known sale price and does not share in any upside or downside price movement of PBL from that contract price.
3. **Forward conversion with options.** A pair of options is used to hedge the stock position, selling calls and buying puts with the same strike price. A hedged ending value of $50 is established.
4. **Total return equity swap.** The investor enters a swap to pay the total return on the $5,000,000 of PBL and receives LIBOR.

Selecting the tool will depend on tax treatment. The goal is to select the tool that will not trigger an existing tax liability.

It is also possible to use **modified hedging** to minimize downside risk while retaining upside in the underlying position.

Protective puts (sometimes called **portfolio insurance**): The investor would purchase puts on 100,000 shares of PBL.

There are several ways to lower the cost of the protection:

- Purchase an out-of-the-money put.
- Use a pair of puts, buying a put with a higher strike price of X_H and selling a put with a lower strike price of X_L.
- Add exotic features to the option (not found in standard options). For example, a **knock-out put** expires prior to its stated expiration if the stock price rises above a specified level. This may reduce the protection, and the option will cost less.

- **No-cost** or **zero-premium collars** are a common way to lower initial cost, in this case to zero, by giving up some stock upside. A put is purchased and a call is sold with different strike prices selected so the premiums are equal.

Prepaid variable forwards (PVF) are economically similar to a collar and loan in one transaction. The owner of 100,000 PBL shares (currently priced at $50) could enter a PVF with a dealer. The dealer would pay the owner $45 per share now, equivalent to borrowing $45 per share. The loan will be repaid by delivering shares of PBL at a future date. The PVF could specify delivery of all 100,000 shares if PBL is below $50 per share on the repayment date but require delivery of a smaller number of shares if the price of PBL rises above $50.

LOS 31.i

A **mismatch in character**, two items in a strategy that trigger different tax treatments. A hedging strategy needs to consider any mismatch and select the tool or strategy that maximizes after-tax value for the investor.

Many tax codes treat employer stock options as an alternative to salary and tax any gains on the options as ordinary income. Hedging the options could produce a mismatch in character. As an example, a gain on stock options of $100,000 is taxed as ordinary income at 30%, while offsetting losses of $100,000 on the derivatives hedge are used to reduce long-term gains that are taxed at 10%. The tax of $30,000 is reduced by only $10,000 of capital gains tax not paid and only if the investor has $100,000 of capital gains to shelter. Whatever the strategy, it is essential to verify how it will be treated for tax purposes.

Yield enhancement with **covered calls** is another potential strategy. The owner of shares could sell call options. The premium income received can be viewed as either enhancing the income yield of the stock or protecting against the stock price decline.

Two **tax-optimization equity strategies** combine tax planning with investment strategy.

1. **Index tracking with active tax management.** Cash from a monetized concentrated stock position is invested to track a broad market index on a pretax basis and outperform the index on an after-tax basis. For example, if dividends are taxed at a higher rate than capital gains, the tracking portfolio could be structured with a lower dividend yield but higher expected price appreciation.

2. **A completeness portfolio** structures the other portfolio assets for greatest diversification benefit to complement (complete) the concentrated position. For example, if the concentrated position is an auto stock, the rest of the assets are selected to have low correlation with auto stocks such that the resulting total portfolio better tracks the return of the chosen benchmark.

Both of these tax-optimization strategies allow the investor to retain ownership of the concentrated position but may take time and sufficient other assets and funds to implement. Both strategies provide diversification while deferring the gain.

A perfect hedge is generally inappropriate if it will cause the underlying gain to be taxed or if the necessary derivatives do not exist. A **cross hedge** may be used instead. The investor who holds a large position in an auto stock but finds it cannot be shorted to create a hedge could consider three cross hedge possibilities:

1. Short shares of a different auto stock or another stock that is highly correlated with the concentrated position. The highly correlated short position will increase (decrease) in

value to offset decreases (increases) in the auto stock.

2. Short an index that is highly correlated with the concentrated position. Shorting a different stock or an index will introduce company-specific risk. A negative event could affect the concentrated position but have no offsetting effect on the value of the short position.

3. Purchasing puts on the concentrated position is also considered a cross-hedge in that the put and stock are different types of assets.

Exchange funds are another possibility. Consider 10 investors, each of whom has a concentrated position in a single stock with a low cost basis. Each investor's position is in a different stock. The investors contribute their holdings into a newly formed exchange fund, and each now owns a pro rata share of the new fund. The investor now participates in a diversified portfolio and defers any tax event until shares of the fund are sold.

LOS 31.j

Privately held businesses may be more concentrated (the owner could own 100% of the business and it may be close to 100% of her assets), the standalone and nonsystematic risk tends to be very high, and the asset is generally illiquid.

Exit strategies for the business must be considered. Exit strategy analysis should consider:

- The value of the business.
- Tax rates that would apply to the potential exit strategies.
- Availability and terms of credit, as borrowing may be involved in financing any transaction.
- The buying power of potential purchasers.
- Currency values if the transaction involves foreign currencies.

The strategies to consider in managing a private business position include:

- **Strategic buyers** take a buy and hold perspective and generally offer the highest price to the seller. Strategic buyers seek to combine the business with an existing business of the buyer.
- A **financial buyer** or a **financial sponsor** is often a private equity fund planning to restructure the business, add value, and resell the business (typically in a 3 to 5 year period).
- **Recapitalization** is generally used for established but less mature (middle market) companies. In a **leveraged recapitalization** the owner may retain 20% to 40% of the equity capital and sell 60% to 80% of his shares back to the company. The owner continues to manage the business with a significant financial stake. A private equity firm could arrange the financing for the company to purchase the owner's stock. In exchange, the private equity firm receives equity in the company. This could be part of a *phased exit strategy* for the owner; sell and receive cash for a portion of his equity in the initial transaction, then participate in and sell his remaining shares when the private equity firm resells their position in a few years.
- In a **sale to (other) management or key employees**, the owner sells his position to existing employees of the company. There are drawbacks:
  - Generally the buyers will only purchase at a discounted price.

- The buyers may lack financial resources and expect the existing owner to finance a significant portion of the purchase with a loan or a promissory note.
- The promissory note is often contingent on future performance of the business with no assurance current employees or managers are capable of running the business and making the payments. This structure may be called a management buyout obligation (MBO) because existing managers buy the business in exchange for an obligation to pay for the business in the future.
- Negotiation with employees to sell the business to them may fail and damage the continuing employer/employee relationship needed to continue operating the business.

- In a **divestiture, sale, or disposition of non-core business assets**, the owner sells nonessential business assets and then directs the company to use the proceeds to pay a large dividend to, or repurchase stock from, the owner. In either case, the owner receives cash while retaining the rest of the stock and control of the business.

- A **sale or gift to family members** could be structured with tax advantages such as the estate tax freeze or limited partnership valuation discounts discussed earlier. The existing owner could do an MBO. Unfortunately, neither a gift nor MBO sale provides the existing owner much immediate cash flow.

- A **personal line of credit secured by company shares**. The owner can borrow from the company and pledge her company stock as collateral.

- With an **initial public offering (IPO)** the owner sells a portion of his shares to the public and transforms the remaining shares into liquid public shares.

- With an **employee stock ownership plan (ESOP)**, the owner sells stock to the ESOP, which in turn sells the shares to company employees. In a leveraged ESOP, the company borrows the money to finance the stock purchase.

LOS 31.k

A single investment in a real estate asset can be large and constitute a significant portion of an investor's assets, bringing a high level of concentrated, property-specific risk. Real estate is generally illiquid and, if held for a long time, may have a significant unrealized taxable gain. A seller considering sale or monetization of a property should consider its current value relative to historical and expected value in the future, taxes on any transaction, availability of credit, and interest rate levels. Strategies to consider include:

- **Mortgage financing** can be an attractive strategy to raise funds without loss of control of the property. With a **nonrecourse loan** the lender's only recourse is to seize the property if the loan is not paid. The borrower effectively has a put option on the property. If the property value falls below the loan amount, the borrower can default on the loan, keep the loan proceeds, and "put" the property to the lender.

- A **donor-advised fund** or **charitable trust** can allow the property owner to take a tax deduction, gift more money to the charity, and influence the use of the donation.

- A **sale and leaseback** can provide immediate funds while retaining use of the property.

LOS 31.l

This final LOS refers to the entire topic and the examples and illustrations found throughout. Questions presume you understand the basic ideas, terminology, and tax calculations covered

here. Don't forget to consider the psychological and nonfinancial issues often associated with these positions.

Module Quiz 31.1

1. **B** A 10% position is not that concentrated, and the contribution to portfolio specific risk not that great. Of the two 40% positions, the owner has less reason to diversify and reduce specific risk because the owner has much more control and is more likely to want the risk as a way to build wealth. The executive has less control with the most need to diversify and reduce specific risk. (LOS 31.a)

2. **B** Using the building in a business he also owns gives the building owner a reason to retain control. (LOS 31.b)

3. **C** Public shares of stock have an ongoing, traded market. Real estate and a private company require going out and seeking a buyer. While the publicly traded stock may represent a concentrated position in the holdings of the executive, there is no reason to assume it is so large a portion of trading volume that there will be a liquidity problem for the stock. (LOS 31.c)

4. **C** Monetization frequently requires a dealer market with a variety of OTC instruments. Dealers will only offer such OTC instruments if the dealers can take offsetting positions in other instruments. This requires that dealers be able to move freely among instruments and take needed positions. Regulation that segments markets and impedes dealers makes it difficult for them to offer the necessary tools to implement monetization. (LOS 31.d)

5. **A** Smith exhibits both rational cognitive behavior (paying himself a market wage) and emotional feelings from employing himself to manage the property he owns. It is common that behavior exhibits both cognitive and emotional elements so the issue is selecting the best answer. There is no accommodation by the manager. The manager explains (educates) and Smith agrees and embraces the idea of selling. This is more reflective of an easy to modify cognitive bias, such as illusion of control. (LOS 31.e)

Module Quiz 31.2

1. **C** Neither is necessary. Either would increase the investor's allocation to their primary capital and decrease holdings in their surplus capital. However, the investors primary capital in the home less mortgage plus savings plus stocks and bonds is $1.0 − 0.7 + 0.15 + 6.0 = $6.45 million, which is more than the primary capital needs of $6.0 million. (LOS 31.f)

2. **C** The primary purpose is to shift taxation of future appreciation and taxes on that appreciation to someone other than the current owner. The other items are certainly appropriate goals and the estate tax freeze might well be structured to aid in meeting those goals, but they are not its primary intent. The freeze might well trigger some tax bill being due now but shift other taxes to someone else payable at a future date and perhaps at a lower rate. (LOS 31.g)

Module Quiz 31.3

1. **A** A prepaid variable forward is equivalent to hedging the risky asset with a collar (buying a put and selling a call) plus borrowing the value of the hedged position. The other two choices are less appropriate comparisons. A protective put consists of owning the asset and buying a put. A covered call program consists of owning the asset and selling calls. They are only partial descriptions of a collar and, hence, less complete answers. (LOS 31.h)

2. **B** SFR 70,000 is received this period and taxed at 40% for a tax due of SFR 28,000. The SFR 100,000 paid increases the cost basis of the underlying asset. When the asset is sold (not this period), that reduces any gain taxed at 10% by SFR 100,000, a potential tax savings of SFR 10,000. This is describing a mismatch in tax character. (LOS 31.i)

Module Quiz 31.4

1. **A** With a public company, a public share price should be available to determine its value. With a private company, value is more difficult to determine and subject to the intended use of the buyer and other factors. Currency and tax issues would have to be analyzed in either situation. Taxation might be more straightforward in selling stock of a public company but determining value is the most significant, time consuming, and significant issue in valuing a private company. (LOS 31.j)

2. **C** This is a sale, and any tax liability is due. The present value of the transaction is most likely the sale price. The sale part of the sale leaseback does give up control, but the leaseback then allows the businessowner to continue using the asset and restores a measure of control, subject to the terms of the lease. A nonrecourse mortgage can be viewed as the equivalent of a protective put and would generally not be taxed as a sale. (LOS 31.k)

Module Quiz 31.5

1.
   - The portfolio lacks diversification with $45 million (90%) in Steve's business.
   - A private business is generally high risk with substantial specific risk.
   - Steve could be misestimating the business's value. He talks about "no doubt" and shows evidence of naive extrapolation of past results into future growth.
   - Even if the value is correct, when Steve retires, he will no longer receive a salary and the company pays no dividend. He will need to generate cash flow for living.

2. Sale to the financial buyer is the best of the three. It is the only one that meets Steve's objective of a clean break from the business and provides ample cash to build a diversified portfolio in excess of their $25 million need. After taxes they should net:

   tax = ($45 − 4)(0.20) = $8.2 million

   After tax, this is $36.8 million plus the $5.0 million in stocks for $41.8 million.

   Even if the business value estimate is too high, this is a considerable cushion.

   The employee buyout is partially funded by Steve and leaves him at risk of going back to running the company. The private equity firm would expect Steve to retain a stake and role in the business.

3. A short sale against the box is a hedging technique that then allows a loan equal to most of the value of the company to be taken out. It requires borrowing and shorting the company stock. It is more suited to a company with public shares.

An exchange fund would involve Steve joining with other individuals who have concentrated positions in other companies. With each investor contributing their shares to the fund, all investors now own a portion of the resulting diversified portfolio. No tax liabilities are realized on the initial contribution of shares.

Neither option makes sense for the Peters because both options leave Steve responsible for running the business. Both are more typically done with public companies. (LOS 31.a, 31.e, 31.h, 31.i, 31.j)

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[1]. This analysis is derived from the information presented in Reading 31 *Concentrated Single-Asset Positions* by Thomas Boczar and Nischal R. Pai of the 2020 Level III CFA exam curriculum.

READING 32: RISK MANAGEMENT FOR INDIVIDUALS

EXAM FOCUS

Be sure you recognize insurance is a risk management and transfer mechanism that in aggregate reduces the expected wealth of the users. Its primary purpose is to protect against adverse financial consequences. Life insurance can insure against premature death and annuities against living too long. Hence, they are risk management tools for the total wealth of the user.

Not every risk warrants the use of insurance. If a risk can be reduced or avoided, that is often the simplest and least expensive way to deal with it. In other cases, it may be best to just accept the risk. If neither of those approaches is acceptable, it may be possible to purchase insurance that will provide monetary compensation if the risk occurs. An investment manager may be able to help clients determine the best approach to a given situation and advise how that solution can change over the client's stages of life.

MODULE 32.1: HUMAN AND FINANCIAL CAPITAL

Video covering
this content is
available online.

LOS 32.a: Compare the characteristics of human capital and financial capital as components of an individual's total wealth.

CFA® Program Curriculum, Volume 5, page 398

An investor's **total wealth** is composed of both human capital and financial capital. **Human capital (HC)** is the discounted present value of expected future labor income. **Financial capital (FC)** is the sum of all the other assets of an individual. This includes financial items such as stocks, bonds, and alternative investments as well as personal items such as a home, car, and other physical assets.

Expected defined benefit (DB) plan benefits for an individual have elements of both HC and FC. DB benefits are deferred labor income, which suggests treating them as HC, but they have already been earned and paid for with past labor to provide future cash flow. This is more analogous to buying a financial asset (FC) and receiving future cash flows. An individual's expected DB plan benefits are best considered as part of the individual's FC.

Human Capital

Valuing **human capital** is analogous to valuing a stock or bond. Value is the discounted PV of future cash flows. The discount rate applied to the future cash flows is related to the riskiness of the cash flows. Higher risk employment requires a higher discount rate and all

else the same reduces the value of the HC. Examples include high yield bond managers and downhill ski racers. Lower risk employment is discounted at lower discount rates. Examples include union employment and tenured college professors.

While the valuation is simple in theory, HC can only be estimated. The estimate requires multiple assumptions: projected future earnings and their real rate of growth, mortality rates to determine the probability the earnings will be realized, real and nominal risk-free discount rates, plus appropriate risk premiums to add to the real discount rate. All of these variables are subject to change over time.

EXAMPLE: Estimating HC

Alex Hamilton is 62 and expected to retire in 3 years. His current annual wage is 100,000 and expected to increase 4% per year. The risk-free discount rate is 3%, and his continued employment is considered very risky. A 10% risk premium is assumed. Using this information and the survival probabilities in the table, calculate his HC.

Increase earnings by 4% per year for the 3 years of employment, probability weight the earnings, and discount to the present value (PV) at 13% per year. 13% is the risk-free rate plus the risk premium.

Year	Probability of Life	Projected Wage	Probability Weighted	PV
1	98%	104,000	101,920	90,195
2	98%	108,160	105,997	83,011
3	97%	112,486	109,111	75,619
4	97%	0		
5	96%	0		
			HC =	248,825

Financial capital is the value of all other assets owned by the individual. It includes current assets such as money market assets that may be consumed within the next year, personal assets such as a car or furniture that are likely to be consumed over time, and investment assets that may appreciate over time. Some assets such as real estate may have both consumption and investment characteristics. Investment assets include both publicly traded marketable assets, which are relatively easy to value, and non-publicly traded. The later include:

- Real estate (other than publicly traded REITs). A home is often an individual's largest single asset and may also be highly leveraged. If leveraged with recourse, default on the loan allows the lender to claim other assets of the individual as well. On a non-recourse loan, the lender can only seize the mortgaged property.

- Annuities (see further discussion later) are economically equivalent to a private defined benefit plan in that they pay a continuing income stream. Their value should include some discount of future cash flows to reflect the potential the payer may default.

- Cash-value life insurance (see further discussion later) is life insurance with a provision to borrow or take some present value portion of the future payout prior to death (which reduces the ultimate payout).

- Business assets or private equity may represent a substantial portion of wealth for some self-employed individuals. This can lead to concentrated risk exposures in the investor's wealth.

- Collectables (such as paintings and book collections) often involve substantial transaction costs and can have elements of personal consumption and utility as well as investment value.
- Pensions can be a significant non-marketable financial asset for some. The pension could be from a private or government entity. The vested portion of the pension already belongs to the individual and can be valued as the discounted value of benefits to be received (PV). The discounting must also include a mortality projection if payments are contingent on the beneficiary being alive (which is typical). The discount rate will reflect the riskiness of the plan portfolio and sponsor as well as any other guarantees or insurance of payment. Future payments of the pension may be indexed for inflation. Typically government pensions will be less risky.

FINANCIAL STAGES OF LIFE

LOS 32.b: Discuss the relationships among human capital, financial capital, and net wealth.

CFA® Program Curriculum, Volume 5, page 402

Net wealth is the sum of the individual's FC and HC less any liabilities owed by the individual. A typical individual might start an employment career with high HC and low FC. As remaining work career decreases with age, HC generally declines over time while FC increases as the individual saves and invests.

LOS 32.c: Discuss the financial stages of life for an individual.

CFA® Program Curriculum, Volume 5, page 408

Education. The individual gains knowledge and skills through formal and informal education and apprenticeship. There is minimal emphasis on saving or risk management.

Early career. The individual enters the workforce, often starts a family, and assumes other personal responsibilities. Saving may be difficult and life insurance may be needed to insure substantial HC against death and the cessation of work income to meet continuing financial obligations to the family.

Career development. After becoming established in a career, job skills can continue to expand and upward mobility increases. Financial obligations often increase to fund the college education of children. Successful individuals generally build FC and retirement savings over time.

Peak accumulation. FC accumulation is typically greatest in the decade before retirement. Earnings and the need to accumulate funds for retirement are high. Financial obligations to educate the children are ceasing. Investment risk may start being reduced in anticipation of retirement. Career risk can also be high as it can be more difficult to find equivalent employment in the event of unplanned job loss.

Preretirement. Emphasis continues to be on accumulating FC for retirement, beginning to reduce investment risk, and tax planning for retirement.

Early retirement. Individuals adjust to a new lifestyle. For those with FC and good health, expenses could increase as they make use of the free time. The portfolio emphasis is on

managing the portfolio so it will last for the remaining lifetime.

Late retirement. This stage is highly unpredictable. Individuals face longevity risk (out living their assets), increasing health care expenses could be an issue, and cognitive functions used to make decisions can decline.

In all stages, there can be unpredicted needs for health care and/or to care for family members.

THE INDIVIDUAL'S BALANCE SHEET

LOS 32.d: Describe an economic (holistic) balance sheet.

CFA® Program Curriculum, Volume 5, page 410

The **economic (holistic) balance sheet** extends the traditional balance sheet assets to include HC. Liabilities are extended to include consumption and bequest goals. This more complete economic view allows better planning of resource consumption to meet remaining lifetime goals as seen in the following example of an economic balance sheet. Note that a defined contribution plan balance with an explicit balance would likely have been included in the traditional balance sheet, but DB plan estimated PV likely would not.

EXAMPLE: Holistic Balance Sheet

(The items in bold italics are those not found on a traditional balance sheet.)

Assets (in thousands):		Liabilities (in thousands):	
Financial		Short-term debt	175
Current assets	500	Home mortgage	500
Investment assets	1,500		
Non-marketable		***Primary capital to fund lifetime expenses***	***3,500***
Home	750		
DC plan balance	1,450		
Private pension	***40***	***Planned bequests***	***1,000***
Government pension	***450***		
Human			
Future labor income	***250***		
Total Assets	4,940	Total Liabilities	5,175

Based only on the traditional balance sheet, the assets of 4,200,000 well exceed explicit debts of 675,000, while the holistic balance sheet shows negative net wealth of 235,000. This suggests consumption and bequest plans are unrealistic. However, it is generally more difficult to value the additional items on the economic balance sheet, and the negative net wealth could be an estimation error. There could also be missing economic assets such as expected inheritance that need to be included. If net wealth is actually negative, it indicates ultimate spending plans will eventually have to change. The relatively low amount of HC (not pension benefits) suggests the individual is near retirement.

For many individuals, total wealth (HC + FC) as well as FC will peak near retirement. Both will then be drawn down in retirement.

The composition of the balance sheet is likely to change over the individual's life cycle. HC is likely the dominant asset for younger individuals. Over time, HC will decline as remaining work life shortens. FC should increase as the individual saves and invests in FC. Net wealth can be positive or negative based on the adequacy of savings versus projected needs. Early in the life cycle assets such as real estate and other tangible assets may dominate the balance sheet. Other FC is then likely to increase in the later stages of life as funds are saved and invested. In early retirement, pension benefits are the dominant asset for many. For wealthier individuals pension benefits may be relatively smaller and FC may be relatively larger.

MODULE 32.2: RISKS AND INSURANCE

Risk management for individuals requires:

- Specifying the objective, which is to maximize household welfare (utility).
- Identifying the risks to FC and HC.
- Evaluating and managing those risks through:
  - Risk avoidance: choose actions to avoid the chance of the loss occurring.
  - Risk reduction: choose actions that reduce the likelihood or amount of the loss.
  - Risk transfer: use insurance products to transfer the loss to others.
  - Risk retention (self-insurance): maintain sufficient assets to absorb the loss.
- Monitoring results and adjusting as needed.

LOS 32.e: Discuss risks (earnings, premature death, longevity, property, liability, and health risks) in relation to human and financial capital.

CFA® Program Curriculum, Volume 5, page 416

The typical risks for individuals include:

- **Earnings risk** (insure with disability insurance) refers to loss in HC. Job loss and other career disruptions can reduce HC and may even lead to the need to consume FC prematurely. Some jobs are inherently more risky than others. A logger has a higher probability of death or injury and resulting loss of HC. A high risk security manager may have a higher risk of job termination. Other jobs are at risk of a location transfer, which could disrupt the HC of a spouse whose job is less mobile and reduce the household's total wealth. Other jobs are cyclical, and income for the self-employed can be less certain.

- **Premature death risk** (insure with life insurance) can be a serious risk early in the career when substantial HC could be lost. In addition, it may cause unexpected expenses that consume limited FC of the survivors.

- **Longevity risk** (insure with annuities) is the opposite of premature death risk as individuals who live too long are at risk of outliving their FC. The determination of how much capital is required for retirement is complicated and risky. A given individual's lifespan is highly uncertain. The return on portfolio assets, rate of inflation, the inclusion or exclusion of inflation adjustment in DB payouts, distribution needs, and other income sources must be estimated. Mortality tables and Monte Carlo simulations are generally used to quantify longevity risk.

- **Property risk** (insure with property insurance) refers to sudden loss in value of physical property (FC). A house or car can be damaged or lost in a flood, a direct loss. This can also trigger unexpected needs such as temporary living or transportation expense or lost income such as rental income, leading to consumption of FC and reduction in total wealth. The loss of business property could reduce FC and also HC of the owner if the property is necessary to generate business income.

- **Liability risk** (insure with liability insurance) refers to being legally responsible for damages and a reduction in FC. The driver of a car may be responsible for damages or loss of life caused by an accident.

- **Health risk** (insure with health insurance) can lead to direct loss of FC to pay illness or injury related expenses. It can reduce HC through diminished or inability to work. It can also affect future expense needs and life expectancy. Coverage for health risk varies widely by country. Government and/or private insurance may provide for short-term but not for long-term care.

MODULE QUIZ 32.1, 32.2

To best evaluate your performance, enter your quiz answers online.

1. An individual's present value of future defined benefit payments will *most likely* be classified as:
    A. financial capital.
    B. human capital.
    C. financial capital and total wealth.

2. Financial capital is *least likely* to peak at retirement for:
    A. the very wealthy.
    B. those with a pension.
    C. those who purchase an annuity.

3. Individuals are *most likely* to need substantial amounts of life insurance in which stage of life?
    A. Education.
    B. Career development.
    C. Early retirement.

4. An individual with negative net worth on a traditional balance sheet:
    A. should reduce expenses.
    B. should increase risk in their investment portfolio.
    C. may have positive net wealth.

5. An individual with a large alternative investment holding in art work is *most likely* to need:
    A. property insurance.
    B. life insurance.
    C. liability insurance.

6. An individual is about to retire. She will receive her first annual pension payment of $25,000 immediately upon retirement and immediately spend it on a lavish vacation. Then, one year later, she will receive another payment. Each payment will increase by 5% from the previous payment amount. Given her life expectancy, she expects to receive a total of 11 payments.

    The risk-free discount rate is 3%, and the risk premium for the pension is 8%. Ignoring the first payment, which she will immediately spend, the pension asset of 10 payments to include on the individual's holistic balance sheet is *closest* to:
    A. 170,000.
    B. 185,000.
    C. 200,000.

MODULE 32.3: LIFE INSURANCE

Basic Life Insurance Terminology

covering this content is available online.

- *Benefits or face amount.* The future payout (e.g., $1,000,000). The terms may specify payout as a lump sum or an annuity.
- *Premium.* The cost of the insurance.
- *Cash value.* What the owner can withdraw before payout, which reduces or terminates final payout.
- *Paid up.* A date when the insurance is fully paid for and no additional premiums are required.
- *Limitations.* Restrictions on the payout of the insurance amount (e.g., misrepresentation of the health status of the insured leading to no payment).
- *Contestability period.* Time period for the insurance company to investigate or deny payment of the claim.
- *Identity of the insured.*
- *Policy owner.* Responsible for making premium payments, often the insured. If the owner is not the insured, he must have an insurable interest in the insured. In other words, the owner must have a vested interest in the continued life of the insured and not simply be speculating on the insured's death.
- *Beneficiaries.* Receivers of the payout.
- *Premium schedule.* Amount and frequency of payments.
- *Riders.* Additional provisions included in the policy.
- *Modifications.* Allowable changes that can be made to the policy.

LOS 32.f: Describe types of insurance relevant to personal financial planning.

CFA® Program Curriculum, Volume 5, page 421

Life insurance protects the survivors from the adverse financial consequences of the insured's premature death. The optimal amount of insurance depends on the cost of the insurance and the loss in value to the survivors caused by the death. The insurance can also provide liquidity to meet death and estate expenses. This is more important if the other estate assets are illiquid. Some life insurance provides tax benefits by accumulating cash value on a tax-sheltered basis.

Life insurance can be grouped in two main types: temporary and permanent. Both require continuing payment of premiums to remain in effect. The premium is often paid annually or on some other designated basis.

> **PROFESSOR'S NOTE**
>
> Insurance terminology is not mutually exclusive. Think of term insurance as pure insurance. What is the cost to charge all members of a large group today such that the funds will cover the payout on those who die this year? In simple terms, if the group includes 100 people, probability of death for any one is 1%, and the payout on death is GBP100,000, charge each individual GBP1,000. For permanent insurance, start with a premium today (higher than GBP1,000) that, if held constant and invested, will for the life of the group provide sufficient funds to pay the death benefit for all members of the group. A 5-year level payment term policy will have some of the characteristics of permanent insurance, but the price will be closer to pure annual insurance. First we discuss the general differences in life insurance type and then we get further into the pricing issue.

Temporary (term) insurance covers only a designated period such as 1, 5, or 20 years. The cost can be fixed or increasing over the designated period. The policy then ceases at the end of the period unless it includes a provision to renew the policy. Term insurance is less costly than permanent insurance because the mortality risk is lower for the insurance company as the individual's risk of dying increases later in life (after the insurance ceases). The mortality risk also means term insurance for younger individuals and for shorter time periods will cost less than for older individuals and longer periods, all other factors the same.

Permanent insurance is more costly and lasts for the life of the insured. The premium (cost) per period is usually fixed, and the policy builds value as the premium exceeds the pure cost of insurance in the initial years. In later years, this built up value covers the increasing cost that would be paid for pure (term) insurance. Permanent insurance can be categorized as whole life or universal insurance.

Whole life typically has a fixed annual premium payment. The policy continues and the policy cannot be canceled by the insurance company as long as premiums are paid. The non-cancelability makes purchase at a young age more desirable as new insurance may be unavailable or much more expensive if the insured person's health deteriorates. The policy may also reach a fully paid status in later years and require no further premiums. Participating whole life shares in company profits and may increase in value more quickly.

Universal life is similar in concept but with more flexibility. The premium payment can be increased or decreased to increase or decrease the amount of insurance and/or the rate at which cash value grows. There may be investment choices for where the premiums are invested. Premium payments can be discontinued and the insurance continues (a non-forfeiture clause) as long as the cash value and earnings on the cash value are sufficient to pay the pure (term) cost of insurance each period.

Life insurance policies can include riders, which provide additional benefits. Accidental death and dismemberment (AD&D) increases the payout if the insured dies or is dismembered in an accident. Accelerated death benefits (ADB) pay part or all of the insurance amount if the insured is terminally ill. A viatical settlement allows the sale of the policy to a third party. This provides immediate funds to the beneficiaries. The third party becomes the policy beneficiary and is responsible for future premium payments. Guaranteed insurability allows the purchase of more insurance regardless of future health. Waiver of premium keeps the insurance in force without premium payments if the insured becomes disabled.

LOS 32.g: Describe the basic elements of a life insurance policy and how insurers price a life insurance policy.

CFA® Program Curriculum, Volume 5, page 421

Life insurance pricing is simple in concept but complex in application. It is a large time value of money problem. The insurance company must charge sufficient premiums such that the money after investing the premiums is sufficient to pay the policy benefits, cover the company's costs, and leave a profit. The company is applying the law of large numbers. The remaining term of life for any one individual is highly uncertain, but predictable in aggregate for a large group. The pricing model can be broken down into three issues:

- **Mortality estimates.** Mortality tables are built to reflect past experience and future projections of mortality. Probability of death (1 − probability of life) can be refined and based on age, health, gender, and lifestyle choices. An 80-year-old male smoker in poor

health who sky dives will pay more than a 40-year-old healthy woman with safer hobbies. The insurance company will gather information regarding the insurability of the applicant and may employ third party investigators and medical professionals to assess the risk factors. The company's goal is to avoid adverse selection and undercharging for the risks assumed.

- **Net premium.** Based on the assumed mortality rates, the company estimates the net premiums to charge for insurance based on an assumed discount rate. The discount rate is also the assumed rate of return on investing the premiums. At that discount rate, the premiums must be sufficient such that the PV of the premiums and payouts are equal (i.e., the premiums must be sufficient to pay future benefits).

- **Load.** The load plus net premium is the **gross premium** charged for the insurance. The load must cover the company's operating cost and expenses for writing the policy. This can include a sales commission to sell the policy and cost of any medical tests to determine insurability. Stock companies are owned by shareholders and must include a planned profit to provide a return to shareholders. Mutual companies are owned by the policyholders but must also charge more than the net premium to cover risk. If costs are eventually less than expected, some policies allow the policyholders to receive a dividend (which is technically a return of premium).

For a simple one-year term insurance policy, the application is relatively simple. Risk is limited as only one year of variables must be considered to estimate the net premium for pure insurance. Load will also be fairly simple to estimate. If the policy is renewed the following year, a new gross premium will be calculated. For a level payment multi-year term policy, the process is slightly more complex. The level premium will be higher than the year 1 and less than the year 5 premium for annual term. The premium is conceptually a weighted average of five sequential one-year term premiums. In reality, it should be higher as the company is at greater risk; it must project the relevant variables for the five-year period and cannot change the premium each year. See Figure 32.1 and Figure 32.2.

Figure 32.1: Annual Term Insurance for $100,000
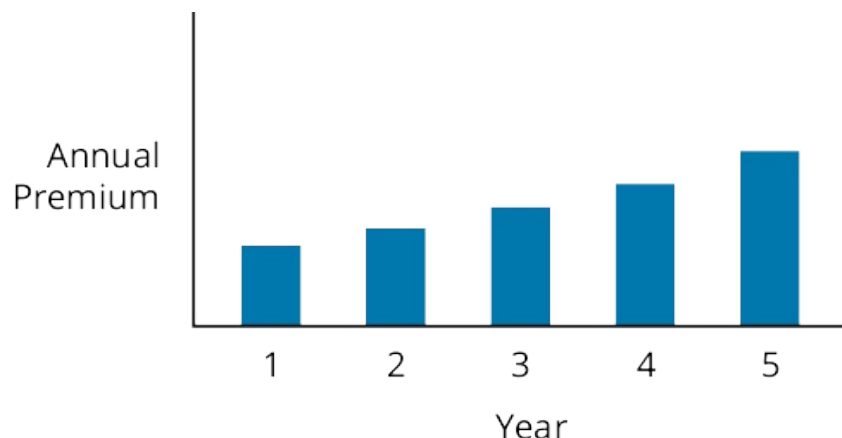
Figure 32.2: 5-Year Term Insurance for $100,000
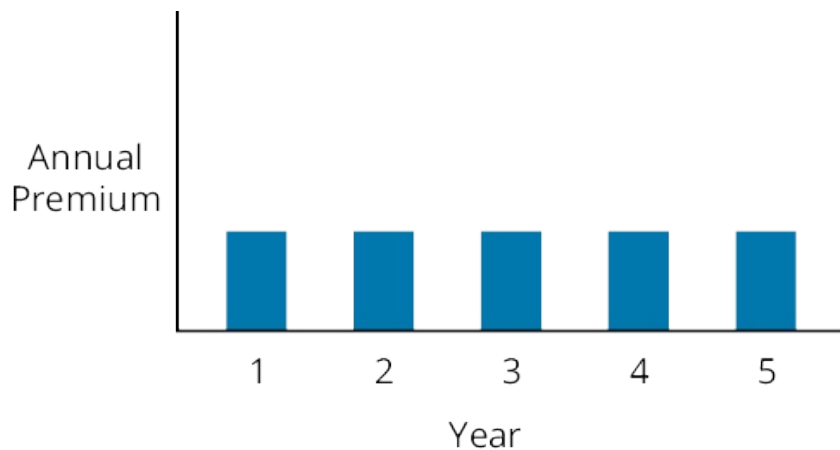
Permanent insurance pricing extends the same concepts, but with more uncertainty as the ultimate life expectancy of the insured individual has to be considered. The longer time period puts the insurance company at greater risk in correctly estimating mortality rate, discount rate (return on invested premiums), and expenses. These factors will make the initial premium higher. In addition, many such policies include a buildup of cash value that the policyholder can access before policy payout. The cash buildup is created by charging an even higher premium. Such policies typically include a paid up date when return on cash value is sufficient to pay future costs of insurance and premiums cease. See Figure 32.3.

Figure 32.3: Insurance Versus Cash Value in Permanent Insurance for $100,000
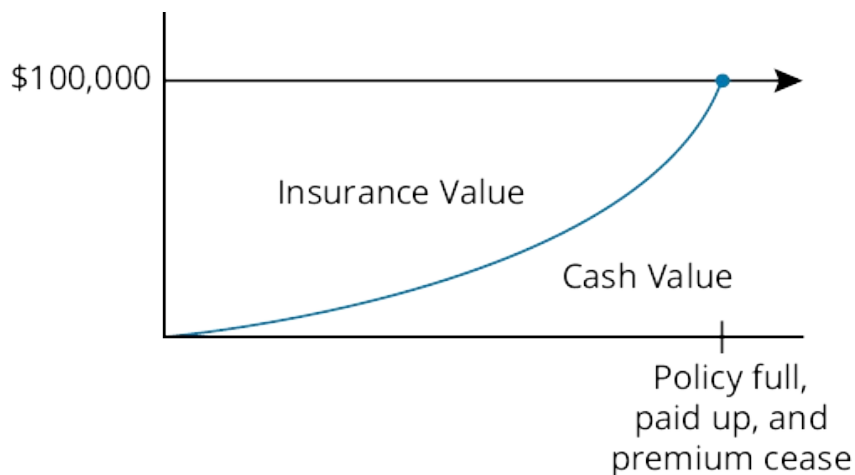
Comparing cost between insurance policies becomes more difficult as policy complexity increases. For annual term, when all else is the same, the lowest premium is lowest cost. For permanent insurance, the number of variables makes comparison complex as it is highly unlikely any two policies will be the same. Two common approaches are the **net payment cost index** and **net surrender cost index**. Both require an assumed age of death for the insured and a discount rate. The second also requires a cash value projection.

> **PROFESSOR'S NOTE**
>
> There is no direct LOS for these methods. However, they are a direct application of time value of money concepts. They are not unreasonable questions. You should also be able to reason through implications if a case clearly favors one policy over another, such as lower premium payment and higher dividend payment, or a lower index value.

To illustrate the issues, assume a 25-year time horizon till death and a 5% discount rate on a $100,000 insurance policy.

- Policy XX has annual beginning of year premiums of $2,000 and an assumed annual end of year dividend (return of premium) of $500. Terminal 25 year cash value projected (by the insurance company) to be $25,000.

- Policy YY has annual beginning of year premiums of $2,200 and an assumed annual end of year dividend (increase in cash value) of $550. Terminal 25 year cash value projected (by the insurance company) to be $27,500.

> 🎓 **PROFESSOR'S NOTE**
>
> **Be careful with the following calculations**. Some steps require use of the **ordinary annuity (payments at end of period)** settings for your calculator. Other steps require the **annuity due (payments at start of period)** setting. If you do not use the proper setting at each step, your answer will be wrong.
>
> Most CFA calculations use ordinary annuity. I keep my calculator set on ordinary annuity and only reset it to annuity due if required for a specific calculation. Then I reset it back to ordinary annuity. Many calculators show a small note on the screen of "beg" or "end" to show the mode.

Net payment cost index assumes the individual dies at the end of the horizon and cash value is not considered. It is often used if the insurance is projected to be paid up at that point:

Step 1: Compute the FV of the premiums paid, an annuity due (premiums paid at start of year).

XX: 2,000 PMT, 5 i_P , 25 n, FV = 100,227

YY: 2,200 PMT, 5 i_P , 25 n, FV = 110,250

Step 2: Compute the FV of the dividends, an ordinary annuity (dividends at end of year).

XX: 500 PMT, 5 i_P , 25 n, FV = 23,864

YY: 550 PMT, 5 i_P , 25 n, FV = 26,250

Step 3: The 25-year FV cost of insurance is Step 1 − Step 2.

XX: 100,227 − 23,864 = 76,363

YY: 110,250 − 26,250 = 84,000

Step 4: Annuitize this FV difference for the annual cost. Use an annuity due to match the requirement to pay premiums at the start of the year.

XX: 76,363 FV, 5 i_P , 25 n, PMT = 1,524

YY: 84,000 FV, 5 i_P , 25 n, PMT = 1,676

Step 5: Divide by $1,000 of insurance policy amount to index the annual cost ($100,000 / $1,000 = 100 units of insurance).

XX: $1,524 / 100 = $15.24 per $1,000 of insurance per year.

YY: $1,676 / 100 = $16.76 per $1,000 of insurance per year.

Net surrender cost index assumes the individual terminates the policy (insurance ceases) at the end of the horizon and the cash value is received. Step 1 and Step 2 are the same. Step 3

will be different and have consequences for Step 4 and Step 5.

Step 1: Compute the FV of the premiums paid, an annuity due (premiums paid at start of year).

XX: 2,000 PMT, 5 i_P , 25 n, FV = 100,227

YY: 2,200 PMT, 5 i_P , 25 n, FV = 110,250

Step 2: Compute the FV of the dividends, an ordinary annuity (dividends at end of year).

XX: 500 PMT, 5 i_P , 25 n, FV = 23,864

YY: 550 PMT, 5 i_P , 25 n, FV = 26,250

Step 3: The 25-year FV cost of insurance is Step 1 − Step 2 less the projected cash value.

XX: 100,227 − 23,864 − 25,000 = 51,363

YY: 110,250 − 26,250 − 27,500 = 56,500

Step 4: Annuitize this FV difference for the annual cost. Use an annuity due to match the requirement to pay premiums at start of year.

XX: 51,363 FV, 5 i_P , 25 n, PMT = 1,025

YY: 56,500 FV, 5 i_P , 25 n, PMT = 1,127

Step 5: Divide by $1,000 of insurance policy amount to index the annual cost ($100,000 / $1,000 = 100 units of insurance).

XX: $1,025 / 100 = $10.25 per $1,000 of insurance per year.

YY: $1,127 / 100 = $11.27 per $1,000 of insurance per year.

PROFESSOR'S NOTE

Many insurance regulators require companies to provide such standardize cost comparisons. Even then, the estimate of true cost depends on the assumptions. Of course, if you can precisely plan when you will die, this would be easier, but that's not a very practical solution.

Estimating the amount of insurance needed is another task. The starting point is estimating the remaining HC (PV of future earnings) of the insured plus expenses associated with the death and the PV of any other legacy goals (financial objectives that would have been met in the absence of premature death). The need may be lower as only expenses of the survivors, not the insured, are relevant.

Other Types of Insurance:

- **Disability income insurance** provides partial replacement of the insured's job income if the job is lost.
- **Property insurance** provides compensation for losses in value of real property. **Homeowners insurance** covers the home, and **automobile insurance** covers the car.
- **Health and medical insurance** covers health care expense.
- **Liability insurance** covers losses if the insured is found legally responsible for damages to another.

To best evaluate your performance, enter your quiz answers online.

1. The volatility of human capital and the demand for life insurance are:
    A. uncorrelated.
    B. positively correlated.
    C. negatively correlated.

2. Which of the following statements regarding the pricing of life insurance policies is *most accurate?*
    A. Mortality tables are built to reflect past experiences of mortality.
    B. For a level payment five-year term policy, the level premium should be higher than the year 5 premium for an annual term policy.
    C. Based on the assumed mortality rates, the insurance company estimates the net premiums to charge for insurance based on the assumed rate of return on investing the premiums.

3. Consider the following policy:

Insurance amount	=	$250,000
Annual premium	=	$4,850
Expected annual dividend	=	$1,190
Time to maturity	=	30 years
Expected surrender value	=	$70,000

Based on a discount rate of 8%, the net surrender cost index per 1,000 of insurance is *closest* to:
    A. $12.70.
    B. $13.10.
    C. $13.80.

MODULE 32.4: ANNUITIES

Video covering this content is available online.

A basic annuity is a one-time premium payout in exchange for fixed payouts received for the life of the annuitant. The initial premium is the investment. When the annuity ends, the payouts cease. The initial investment is not returned at the end. The overly simple analogy is to a level payout amortizing mortgage, the payouts are interest and a return of principal. The complication in an annuity is how long the insured's life will last. Basic terminology includes:

- The **insurer** collects the premium and makes the future payouts. (The insurer is often an insurance company, the company.)

- The **annuitant** receives the **annuity payouts** in the future.

- The contract **owner** pays the premium to purchase the annuity and is usually the annuitant.

- The **beneficiary** receives any remaining value of the contract at death of the annuitant. In many cases, there is no beneficiary as payouts cease at death of the annuitant.

- The **premium**, which is normally paid once at purchase, could also be referred to as the value of the contract. **The premium paid to the company is the price of the annuity.** However, the convention is to keep the premium constant and adjust the stated annual payout. This means that a **lower/higher quoted payout to the annuitant is equivalent to a higher/lower price for the annuity**.

LOS 32.h: Discuss the use of annuities in personal financial planning.

Annuities are the economic opposite of life insurance: for life insurance, pay an annual premium and receive one payoff at death to insure against premature death; for annuities, pay once and receive payouts back for life to insure against longevity risk. Both products spread the risk of when any one individual will die across a large pool of individuals.

Annuities take many forms. A DB pension plan from a private company or government that pays for the life of the retiree is a form of annuity. Annuities can also be purchased and used to supplement or replace DB plan payouts. While the potential permutations and features are not limited, annuities can generally be classified as deferred versus immediate and fixed versus variable. Usually, the annuity is illiquid once purchased, though it is possible there can be provisions to liquidate early or sell the future payout stream to a third party.

In a **deferred annuity**, the annual receipts start at a deferred future date. **Deferred variable annuities** are common and allow the owner to select from a list of investment options. Higher/lower investment returns will increase/decrease the future payouts to be received. While often compared to mutual funds, the investment choices are more limited and expenses are high. The annuity can also include an insurance feature with a guarantee of some minimum payouts received back. Otherwise, the payouts would just cease at death of the recipient. The investor may also be able to cash out the value and terminate the annuity at a future date (subject to a surrender charge that reduces what they receive). Unless the individual pays for additional features, the variable annuity does not guarantee any minimum future payouts.

Deferred fixed annuities pay a fixed benefit for life that starts at a defined future date. The longer the delay between initial premium paid and start of payouts received, all else the same, the lower the cost of the annuity, as the company can invest and increase the funds available before making payouts on the annuity.

An **advanced life deferred annuity** is a relatively lower cost way to hedge the longevity risk of the annuitants outliving their other assets. Like most fixed and variable annuities, they require an immediate premium payout at purchase. Like deferred fixed annuities, the payouts are fixed, but the delay period before they start is long, often age 80 or 85 for the annuitant. The low premium reflects three factors. First, the long delay before payouts begin allows the company a longer period to invest and grow the premium's value. Second, the period of payouts will be shorter as the life expectancy of the older annuitant will be shorter when payouts do begin. Third, a greater proportion of the annuitants will die before they receive any payouts.

Immediate variable annuities start payouts immediately, but the amount of the future payouts is indexed to the performance of some reference asset, such as a stock index. As the reference asset increases/decreases, the payouts increase/decrease. **Immediate fixed annuities** begin payout immediately and the payout amount does not change.

The features of the annuity and the annuitant's status will affect the payout. Typical features include:

- Life annuity with payouts for the life of the annuitant.
- Period certain annuity with payouts for a specified time period.
- Life annuity and period certain with payouts for the longer of the two periods.

- - Life annuity with refund is similar in concept but specifies a refund amount if a specified minimum payout amount has not been received before death of the annuitant.
  - Joint life annuity specifies payout continues as long as at least one of the annuitants is alive.

Consider an initial $100,000 investment in (premium paid for) an annuity.

- A 60-year-old female might receive 5,900 per year for life on an immediate fixed annuity, while a 60-year-old male might receive 6,300. The higher payout for the male reflects the statistical probability he will not live as long, and total payouts made by the company will be less.
- Annual payouts for an 80-year-old female or male will be higher, say 14,300 and 15,200 respectively. This reflects that their remaining life expectancy is shorter, reducing the number of payouts the insurance company is likely to make.
- A rider specifying payouts be made for at least 10 years reduces the annual payout, reflecting higher cost to the insurance company. It no longer benefits from cessation of payouts to annuitants that live less than 10 years.
- A joint life provision that payouts continue as long as either member of a couple is alive will lower the annual payout on any of the previous annuities. Statistically, this increases the total number of payouts as the company pays as long as at least one member is alive.
- Adding a, or increasing the deferral period until start of payouts would increase the annual payout, as the company can keep the premium invested longer and it reduces the number of payouts excepted to be made.
- Generally, in any of the previous policies, the initial annual payout on a variable annuity will be lower than a fixed annuity, but the expected total payout amount can be higher for the variable annuity based on the performance of the reference asset. Of course, there is no guarantee of this; it depends on the performance of the reference asset.

> **PROFESSOR'S NOTE**
>
> It should be occurring to you that the number and combination of features on insurance products is infinite. Why would that surprise you? Think product proliferation. The companies have every incentive to offer a vast menu of options to attract customers. Do not imagine the CFA material can produce a comprehensive analysis model. It does not exist. That does not mean a question cannot be written that can be solved by applying the basic economic and time value of money concepts being discussed; just think the case facts through logically.

LOS 32.i: Discuss the relative advantages and disadvantages of fixed and variable annuities.

CFA® Program Curriculum, Volume 5, page 438

The **volatility** of future benefits is obviously different. Lower risk investors may prefer the certainty of fixed payouts, and higher risk investors may prefer the potential for increasing variable payouts.

Flexibility often differs. Fixed annuities are generally irrevocable and payouts cannot be changed. In variable annuities the future value of the annuity and payouts are linked to the

performance of a reference asset. Variable annuities are more likely to allow withdrawal of the funds at subsequent market value (after surrender fees for withdrawal).

Future market expectations will affect the choice. Payouts on a fixed annuity are largely determined by initial bond market interest rates. If rates are expected to increase, delay in purchase can lead to higher payouts on annuities purchased later.

However, the choice is not so simple and requires a consideration of **mortality credits**. Some individuals will die before, and some after, their expected lifespan. Annuitants who die earlier collect fewer payouts, effectively subsidizing those who die later. That is why insurance is called risk sharing or transfer. This concept is called mortality credits. All other factors the same, mortality credits make annuities less costly to purchase at a younger age. (Think of it as the annuitants who live longer earn a mortality credit paid by those who do not live as long and collect fewer payouts). However, the effect of mortality credits is difficult to see directly because other factors are also often changing.

As a simple example, consider a 60 year old who pays $100,000 for a lifetime annual payout of $5,000. Waiting to age 65 for the purchase might produce an annual payout of $6,000. Waiting appears to be economically beneficial, but this is deceptive. If market conditions are unchanged, the payout amount is reduced by mortality credits but increased by the fact the older individual who waits to purchase will statistically receive fewer payouts.

An easier way to see the effect of the mortality credit is to look at a deferred annuity for the 60 year old, which would start payouts at age 65. The initial payout could be $6,450. This is clearly better than if the individual waits until age 65 to purchase and immediately start receiving $6,000. It is the same individual, so the total payouts to be made are the same. Even here, two factors are at work. The annual payout amount, if purchased at age 60 to start payouts at age 65, is higher because the company can invest the premium for 5 years before making payouts at 65, and it is also higher because some of the annuitants will not live to age 65 to collect anything. Those who die earlier have subsidized and paid a mortality credit to those who live longer than age 65 and collect payouts.

> 🎓 **PROFESSOR'S NOTE**
>
> While the effect of mortality credits can be difficult to see directly, the concept is fundamental to insurance risk sharing and pricing.
>
> - Just remember that for life insurance the ultimate cost is lower if you die and the beneficiaries collect the one-time fixed payout sooner, while those who live longer end up paying more for the same payout. Admittedly, who wants to die sooner! (Be careful that your beneficiaries want you around for a long time.)
> - For annuities, the issue reverses; annuitants who live longer end up collecting more and are subsidized by those who die sooner and collect less.
>
> While this is a bit morbid, rest assured the insurance company is not stupid and fully understands all the implications of mortality tables, future payouts, and how they affect insurance pricing. The industry invented mortality tables.

Market expectations also affect variable annuity versus fixed annuity payouts because variable annuities shift risk to the annuitant from the company. The payout is based on the future performance of the risky reference asset. The annuitant earns both a mortality credit and a risk premium. The net effect is the total expected value of the payouts is higher, reflecting the higher expected return on the reference asset (although the initial annual payout is generally lower). The variable annuity is also more likely to allow cashing out, but at a value linked to the reference asset. There is a downside; fees for variable annuities tend to be

higher. Variable annuities are also more complex and difficult to analyze. This difficulty tends to reduce price competition and further increase the price of variable annuities (i.e., lowers the annual payout received for premium invested compared to fixed annuities).

Inflation is also a factor. Variable annuities that link payout to an appreciating asset like the stock market are more likely to provide long-term inflation protection. Conventional fixed annuities that pay a constant nominal amount offer no inflation protection. (In contrast many DB plan benefits are indexed to inflation.) A fixed annuity with a rider to increase payments with inflation can be purchased, but at a higher cost. Alternatively, fixed annuities can be designed with payments that increase by predetermined amounts for some inflation protection. The prespecified increases may or may not match actual inflation.

Taxes are a factor, but they are complex and vary by jurisdiction. Consult a qualified advisor before making decisions. Typically, increases in value of an insurance product are not taxed before payouts. At payout, tax may or may not be due on the increase in value.

> **PROFESSOR'S NOTE**
>
> This tax comment is more cautionary than comments in some other Level III insurance readings. The bottom line in all the readings is taxation of insurance products is complex, you need more than the CFA curriculum will provide, and there can be some tax advantages. Do not send emails saying the statements in the different readings are not identical. The bottom line is consistent among readings.

The alternative to purchase of an annuity is to **self-insure** longevity risk. In other words, invest in financial assets and set a withdrawal amount that lasts to an assumed life expectancy. The life expectancy should be high because the alternative is running out of money. The decision is complex because the annuity payment reflects three components:

- Return of the principal (premium).
- Interest on the principal.
- Mortality credits as annuitants who die sooner are subsidizing (receiving fewer payouts) the annuitants who live longer (receive more payouts).

Self-insurance can earn the first two, but not the third. This favors use of the annuity. However, use of annuities reduces aggregate wealth of the users as the insurance companies invest rather conservatively and must cover costs plus profit (which is just the cost of invested capital). The decision becomes how much risk for the retiree to take versus cost. Factors that favor use of annuities rather than self-insurance include:

- A longer than average life expectancy.
- A desire for lifetime income.
- Less desire to leave an estate for the benefit of others.
- Conservative investors (high risk aversion).
- An absence of other guaranteed income sources such as pensions.

> **MODULE QUIZ 32.4**
>
> *To best evaluate your performance, enter your quiz answers online.*
>
> 1. Insured individuals who live longer than the statistical average are *most likely* to earn a positive (benefit from the) mortality credit with:
>   A. life insurance.
>   B. an annuity.

C. both life insurance and an annuity.

2. In which of the following situations would an individual be *most likely* to purchase a variable rather that a fixed annuity?
    A. They need a more certain income stream.
    B. They want to avoid higher fees.
    C. They want the flexibility to redeem the annuity in the future.

MODULE 32.5: COMPREHENSIVE EXAMPLE AND REVIEW

LOS 32.j: Analyze and critique an insurance program.

CFA® Program Curriculum, Volume 5, page 449

> **PROFESSOR'S NOTE**
>
> This LOS is typical of Level III. A question can describe facts and ask for an answer that may draw on any of the relevant material covered in the readings. Don't panic, the case facts and taught material will provide the answer; just keep your cool and think it through.

Risk management involves multiple techniques. Some risks can be avoided (risk avoidance) (e.g., don't own expensive cars that are costly to repair). Avoiding the risk is a pure form of loss control. Loss prevention involves reducing the probability of the loss (e.g., keep the car in secure storage). Loss reduction involves taking actions to reduce the amount of the loss [e.g., installing fire suppression devices (the fire may still occur, but the likely damages are reduced)]. Risk management also involves risk transfer (buying insurance) and risk retention (self-insurance).

One approach to risk management involves categorizing the severity and frequency of the loss. Severity refers to the size of the loss in relationship to the financial resources of the individual. A $50,000 loss could be trivial to some but devastating to others. Likewise, if the loss is infrequent, it is less burdensome than if it occurs frequently. The matrix classification in Figure 32.4 can indicate the appropriate risk management technique to use.

Figure 32.4:   Risk Management Decision Matrix

Characteristic of the loss:	Occurs regularly	Infrequent
Very severe	Risk avoidance	Risk transfer
Not severe	Risk reduction	Risk retention

EXAMPLE: Analyze an Individual's Insurance Program

Case facts:

- A couple in their early 40s has 3 dependent children.

- The husband earns $200,000 annually and is employed in a low risk profession. The employer provides life insurance equal to 2 years of salary. The health insurance plan is generous and covers the family. The employer provides short-term disability insurance to cover 75% of the earnings of the husband, but the benefits last for only 3 months.

- The wife works part time and earns $10,000. Her primary responsibility is care of the children and home. She expects to return to the workforce in the next few years. Her job skills are current, in high demand, and highly compensated.

- Their home was purchased a few years ago at the bottom of a severe real estate collapse and has appreciated 150%. The original loan balance was 90% of purchase price has been only slightly

HUMAN CAPITAL AND THE IMPLICATIONS FOR ASSET ALLOCATION

LOS 32.k: Discuss how asset allocation policy may be influenced by the risk characteristics of human capital.

CFA® Program Curriculum, Volume 5, page 456

Asset allocation should consider the investor's total economic wealth, FC and HC. The characteristics of the HC are relatively hard to change, so the adjustment is likely to be in the FC. The nature of the HC may affect both the overall risk taken in the FC, and the assets and asset classes selected. For example, an individual employed in a high-risk profession would, all else the same, choose lower risk FC. If the HC is positively correlated with the stock market, then it will be best to select asset classes other than equity for any risky assets that are used. Of course, the individual should try and avoid FC tied directly to her employer.

The characteristics of HC can be complex. For example:

- For a couple, the HC of each member is not likely to be perfectly correlated (+1) with the other, making the couple's HC in aggregate less risky. Likewise, if both are employed, the couple's HC is less risky than if the same amount were earned but only by one member of the couple.

- If one member of the couple has less geographically mobile career skills, the couple's HC is at risk if the other member must move.

- If one member of the couple is not working but could return to work if needed, that lowers the risk of the couple's HC.

- Generally, HC is less risky than many forms of FC, and, all else the same, the asset allocation in FC is tilted toward riskier assets.

LOS 32.l: Recommend and justify appropriate strategies for asset allocation and risk reduction when given an investor profile of key inputs.

CFA® Program Curriculum, Volume 5, page 459

> **PROFESSOR'S NOTE**
>
> Another cumulative LOS that can lead to a question and facts that draw on any of the relevant material covered in the readings.
>
> The reading terms idiosyncratic and systematic risk are analogous to more general terms in portfolio theory. Idiosyncratic is specific or diversifiable risk that can be reduced through diversification or use of insurance products. Insurance is just a pooling and diversification of risk through the insured group. For example, life insurance pools the risk of those who die sooner and later than expected. Systematic risk is market risk for which the holder should be compensated. More/less risk tolerant individuals may choose more/less systematic risk.

Risk management strategies include:

- Determining and taking the appropriate amount of systematic (market) risk through an asset allocation of total wealth.

- Reducing where appropriate idiosyncratic (non-market) risks:

- Through asset diversification.
- Use of insurance to transfer risks.

For example:

- A young MBA with large debts and high expenses may skip saving for retirement in the early years of her career. If there is any need for life insurance, it should be low-cost, temporary insurance. Security portfolio diversification is relatively unimportant while HC dominates FC.
- A financially well off couple nearing retirement must be more concerned with FC diversification. Outliving the FC becomes of greater concern and longevity risk can be hedged with annuities. HC shrinks and the need for life and disability insurance diminishes or ceases. Health, long-term care, and liability insurance are more important priorities. The more affluent may choose to self-insure as long as it does not imperil standard of living.

CONCLUSION

The risk management process for individuals is complex and must consider risk and return to total wealth. At different stages of life, the relative importance of and risks to human and financial capital will shift. Market risks to FC can be largely addressed with standard portfolio tools. Adding insurance tools provides more comprehensive risk management of HC and total wealth.

MODULE QUIZ 32.5

To best evaluate your performance, enter your quiz answers online.

1. An individual should *most likely* purchase insurance for a risk that:
   - A. poses high standard of living risk and is infrequent.
   - B. poses high standard of living risk and is frequent.
   - C. is smaller in amount and infrequent.

2. An individual in a high-risk job will *most likely*:
   - A. increase their allocation to industries that are highly correlated with their wage income.
   - B. increase their allocation to risk-free assets.
   - C. reduce their savings.

3. The need for retirement savings is *most likely* higher for:
   - A. a recent college graduate with very young children.
   - B. a young couple who has recently received a large inheritance.
   - C. an older couple in their peak earnings years but employed in a declining industry.

KEY CONCEPTS

LOS 32.a

Total wealth is composed of both human capital and financial capital. Human capital (HC) is the discounted present value of expected future labor income. Estimation includes the future amount, the probability the individual will be alive to earn it, and a discount rate related to the riskiness of the amounts. Financial capital (FC) is the sum of all the other assets of an individual.

LOS 32.b

Net wealth is the sum of the individual's FC and HC less any liabilities owed by the individual. A typical individual might start an employment career with high HC and low FC. As the individual's remaining work career decreases with age, HC generally declines over time while FC increases as the individual saves and invests.

LOS 32.c

Generally, HC is highest in early career and declines until retirement. FC is likely to peak at retirement. The life stages are Education, Early Career, Career Development, Peak Accumulation, Preretirement, Early Retirement, and Late Retirement.

In all stages, there can be unpredicted needs for health care and/or to care for family.

LOS 32.d

The economic (holistic) balance sheet extends the traditional balance sheet assets to include HC. Liabilities are extended to include consumption and bequest goals. This more complete economic view allows better planning of resource consumption to meet remaining lifetime goals.

LOS 32.e

- Earnings risk. Job loss and other career disruptions can reduce HC and may even lead to the need to consume FC prematurely.
- Premature death risk. Can be a serious risk early in the career when substantial HC could be lost and cause unexpected expenses that consume limited FC.
- Longevity risk. Individuals who live too long are at risk of outliving their FC.
- Property risk. Loss in value of physical property (FC).
- Liability risk. If legally responsible for damages, leading to a reduction in FC.
- Health risk. Direct loss of FC to pay illness or injury related expenses and may reduce HC through diminished or inability to work.

LOS 32.f

- Life insurance protects the survivors from the adverse financial consequences of the insured's premature death.
- Disability income insurance provides partial replacement of the insured's job income if the job is lost.
- Property insurance provides compensation for losses in value of real property. Homeowners insurance covers the home and automobile insurance covers the car.

- Health and medical insurance covers health care expense.
- Liability insurance covers losses if the insured is found legally responsible for damages to another.

LOS 32.g

Temporary life insurance is for a set period of time. **Permanent insurance** builds up value sufficient to pay for insuring the remaining lifetime of the insured. Pricing reflects **mortality estimates** that determine how many in the group are expected to die during the insurance period and allow calculating the **net premium** to charge to make those payouts. **Load** is an estimate of company expenses and profit that is added to determine the **gross premium** charged for the insurance.

LOS 32.h

Annuities are the economic opposite of life insurance, pay once and receive payouts back for remaining life to insure against longevity risk. **Immediate annuities** begin payout immediately and **deferred** at a future time. **Fixed annuity** payouts do not change in amount, and **variable** payouts are linked to change in a reference asset.

LOS 32.i

Fixed versus variable annuities:

- Fixed provide a known future payout, while variable have a better chance of keeping up with inflation.
- Fixed will be priced to reflect bond market rates at the time of purchase, while variable will perform in line with changes in the reference asset and are more likely to allow withdrawals.
- Fees for variable are generally higher.
- Both may be subject to some taxes.
- Both earn a mortality credit:
    - For life insurance, the ultimate cost is lower if you die and the one-time fixed payout occurs sooner, while those who live longer end up paying more for the same payout.
    - For annuities, the issue reverses; annuitants who live longer end up collecting more and are subsidized by those who die sooner and collect less.

LOS 32.j

A cumulative LOS, expect questions that draw on the entire reading.

Characteristic of the loss:	Occurs regularly	Infrequent
Very severe	Risk avoidance	Risk transfer
Not severe	Risk reduction	Risk retention

LOS 32.k

Asset allocation should consider the investor's total economic wealth, FC and HC. For example, an individual employed in a high-risk profession would, all else the same, choose lower risk FC. If the HC is positively correlated with the stock market, then it will be best to select asset classes other than equity for any risky assets that are used. Of course, the individual should try and avoid FC tied directly to her employer.

LOS 32.l

A cumulative LOS, expect questions that draw on the entire reading.

- Determine and take the appropriate amount of systematic (market) risk through an asset allocation of total wealth.
- Reduce where appropriate idiosyncratic (non-market) risks:
    - Through asset diversification.
    - Use of insurance to transfer risks.

Module Quiz 32.1, 32.2

1. **C**   While DB plan benefits have elements of both FC and HC, they are best categorized as FC. They are also part of total wealth, making C the best answer. (Module 32.1, LOS 32.a)

2. **A**   The very wealthy may spend less than the total return earned on their assets and see FC increase over time. All others are more likely to spend more than their return and see FC decline. The value of both pensions and annuities is the PV of expected future payments and so declines with age and the reduction in number of future payments. (Module 32.1, LOS 32.a)

3. **B**   HC and the need for life insurance is likely at its peak in the early career stage, followed by the career development stage when the expected work career and HC remain high. (Module 32.1, LOS 32.c)

4. **C**   Making changes based only on the traditional balance sheet analysis would be premature because it fails to consider all economic variables affecting the individual. The holistic balance sheet with all variables included could show positive net wealth. On the traditional balance sheet, negative balance may mean little. Individuals who are early in their career with college debt could have negative net worth. Even if both balance sheets show a negative balance, it does not mean immediate changes must be made, only that long-term plans may need revision. (Module 32.1, LOS 32.d)

5. **A**   While it is true they may be wealthy and may also need the other two, the direct need is for property insurance. (Module 32.2, LOS 32.e)

6. **B**   The first pension receipt is offset by a liability, a planned expenditure, so it has zero value in our calculations.

    The long (and unrealistic under exam conditions) way to solve this question is to set up a spreadsheet to project the payments at end of year 1 to 10 with the first payment on the spreadsheet being 5% higher than the 25,000, and all subsequent payments increasing by 5% annually. Each FV payment would be discounted to PV at 3% + 8% = 11%. The more realistic way to solve the question is to realize the starting 25,000 is growing 5% each year and is then discounted at 11%. This can be reduced to a net discount rate (including the effect of growth) each year of [1 + (0.03 + 0.08)] / 1.05 − 1 = 5.7%.

    The question is then an ordinary annuity calculation of 10 payments: 10 n, 25,000 PMT, 5.7 ip, PV = 186,646.

    Variations on this calculation such as [(1.03)(1.08)] / 1.05 − 1 or 3 + 8 − 5 are also likely to be acceptable but less consistent with the CFA text. (Module 32.1, LOS 32.d)

Module Quiz 32.3

1. **C**   Human capital volatility and demand for life insurance are negatively correlated. Life insurance acts as a substitute for human capital, so its face value depends on the perceived value of the human capital it replaces. If the human capital has high volatility

(equity-like), a higher discount rate is used to estimate its present value. Thus, human capital with high volatility has a smaller present value than human capital with low volatility. (LOS 32.g)

2. **C** Based on the assumed mortality rates, the insurance company estimates the net premiums to charge for insurance based on an assumed discount rate. The discount rate is also the assumed rate of return on investing the premiums. At that discount rate, the premiums must be sufficient such that the present value of the premiums and payouts are equal so that the premiums are sufficient to pay future benefits. The level premium will be higher than the year 1 and *lower* than the year 5 premium for annual term. The premium is conceptually a weighted average of five sequential one-year term premiums. Mortality tables are built to reflect both past experiences *and future projections* of mortality. (LOS 32.g)

3. **A** The CFA convention is premiums are paid at the start of the year as is the annuitized cost (annuity due) and dividends are received at the end of the year (ordinary annuity).

$FV_{premiums}$	=	$593,377.46 (annuity due: $4,850 annual payment, 30 years, 8%)
$FV_{dividends}$	=	$134,807.02 (ordinary annuity: $1,190 annual payment, 30 years, 8%)
FV_{net}	=	$388,570.44 (future value of premiums less dividends and surrender value)
$Annual_{net}$	=	$3,176.00 (annuity due payment: $388,570.44 future value, 30 years, 8%)
NSCI	=	$12.70 per $1,000 per year (net annual cost divided by 250 [$250,000/$1,000])

(LOS 32.g)

Module Quiz 32.4

1. **B** With a long life, the individual will collect more payouts than the average annuitant and benefit(earning the positive mortality credit). In contrast, the payout on life insurance will be further in the future, and they are effectively subsidizing (earning a negative credit) those with a shorter life whose beneficiaries are paid the policy amount sooner. (LOS 32.i)

2. **C** Variable annuities are more likely to allow cashing out (at the market value with surrender fees). Fixed annuities have more certain income and generally lower fees but are generally not redeemable. (LOS 32.h)

Module Quiz 32.5

1. **A** This is the most likely situation to use insurance. It will be difficult to recover if the risk is realized, and because it is infrequent, the cost of insurance will be relatively lower. B is something to avoid, and C is a good case for self-insurance (risk retention). (LOS 32.j)

2. **B** Higher risk HC will, all else the same, reduce the allocation in FC to risky assets in favor of lower risk assets. The risky job makes savings more important and investing in assets with positive correlation to HC should generally be avoided in order to provide diversification within total wealth. (LOS 32.k)

3. **C** This is typically the period of maximum savings for retirement, and the risk of early job loss makes this even more important. While it is always good to start saving for retirement, the other two likely have more immediate needs. Answer choice A probably needs low-cost term life insurance and liquidity. B is likely in good financial shape and could benefit from advice on what to do with the inheritance. B can certainly consider retirement savings, but C has the greatest need. (LOS 32.l)

Use the following information for Questions 1 through 6.

Chen Wang and his wife, Tao, have been married for nearly 30 years, during which time they have enjoyed enormous business success. The Chens started their marriage as small shopkeepers and grew their business rapidly. They turned their first shop into a successful chain of retail stores. From that base, they expanded into global trading. Eventually, they began to manufacture a variety of items for sale in both their own stores and for export.

After diversifying their business geographically and integrating vertically, the Chens broadened their business interests into real estate. Their holdings expanded beyond their initial investment in residential apartments into large commercial spaces and office buildings. Ultimately, they parlayed their first small business into a large conglomerate, incorporating several industries on both sides of the Pacific. Even though Chen Wang is 61 and his wife is 58, they remain very active in running their businesses.

In addition to their varied business interests, the Chens have a substantial portfolio of marketable securities. Although they have historically managed their securities portfolio themselves, they decided to bring in a professional adviser once the portfolio exceeded 100 million Hong Kong dollars (HKD).

They are now consulting Park Jung Hee, CFA, about the asset allocation and security selection in their investment portfolio.

The Chens tell Park, "We have two grandchildren, and we would like to be able to leave each one 100 million HKD in today's dollars (i.e., in real value) of marketable securities in our estate. Also, kindly plan our investments so that the portfolio reaches this target by the time I am 75. In addition, please ensure that we have enough in retirement savings for travel-related and health-related expenses." Park points out that the current value of the portfolio is already 102 million HKD, so their investment goals should be reachable, especially because the Chens are not subject to income taxes on portfolio income or capital gains. The Chens would also like to fund some charitable activities. "If the portfolio can afford it, we would also like to give 25 million HKD to various organizations upon our death."

Park reviews the current holdings in the portfolio with the Chens. He notes that the portfolio contains nearly 20 million HKD of equity in the Golden Flower Trading Company (GFTC). The Chens have had GFTC in their portfolio for several years because they consider it a good company. Park advises them, however, to sell some of the position in order to diversify their portfolio. Chen Wang points out to Park that GFTC has fallen 15% from its high, reached several months ago. "We don't want to lose money, so please wait to sell until it comes back."

Chen Tao has also expressed some reservations about leaving the grandchildren such large sums of money and asks for recommendations for a cost effective way to provide the benefits of the money over an extended period of time to the grandchildren. Park promises to get back to the Chens with some suggestions.

1. Based on the Chens' situation, their *least likely* need for insurance is to manage:
    A. property risk.

B. longevity risk.

C. liability risk.

2. Which of the following is *least likely* to be considered an investment constraint for a private client?

   A. Portfolio size.

   B. Risk tolerance.

   C. Time horizon.

3. When evaluating the Chens' investment objectives, how many time horizons should Park consider?

   A. 1.

   B. 2.

   C. 3.

4. Chen Wang's reluctance to sell GFTC until it returns to its earlier high is *best* described as:

   A. loss aversion.

   B. mental accounting.

   C. self-control.

5. Park suggests to Chen Wang that derivatives can be used as an alternative to an immediate sale as a way to reduce the risk in GFTC. In order to retain all of the security upside and minimize initial cost, Park would recommend:

   A. a collar.

   B. an at-the-money protective put.

   C. buying an OTM put and selling a further OTM put.

6. Based on the Chen Tao's objectives, Park is *most likely* to recommend:

   A. a discretionary trust with the grandchildren as the beneficiaries.

   B. term life insurance on the grandchildren.

   C. a deferred start annuity with the grandchildren as the annuitants.

TOPIC ASSESSMENT ANSWERS: PRIVATE WEALTH MANAGEMENT

1. **B**   With extensive property and complex global business interests, they are likely to have substantial property and potential legal/liability risk that warrant insurance. Given their apparent wealth and bequest plans, the risk that they will have insufficient funds for living expenses is most likely low. (Study Session 13, Module 32.2, LOS 32.e)

2. **B**   Although risk tolerance is a critical aspect of an IPS, it is not considered an investment constraint. The main categories of investment constraints for private clients are time horizon, portfolio scale (or size), and tax planning. (Study Session 12, Module 28.1, LOS 28.a)

3. **C**   The Chens have multiple time horizons: the estate goal (time horizon of 14 years), their retirement goals (time horizon exceeding 20 years), and the charitable goal (time horizon exceeding 20 years). (Study Session 12, Module 28.6, LOS 28.j)

4. **A**   The Chens are showing loss aversion by not wanting to sell GFTC and take a significant loss. Compared to younger investors, retirees and individuals approaching retirement are likely to be more loss-averse, which affects their return assumptions and asset allocation decisions during retirement. (Study Session 12, Module 28.5, LOS 28.h)

5. **C**   Only one choice meets all the objectives of reducing the risk, retaining all upside, and reducing initial cost. Purchase and sale of the puts won't eliminate all risk, but it does eliminate risk between the two strike prices. All upside is retained, and sale of the lower strike price put reduces initial cost. A collar gives away all upside above the call strike price. The ATM put is the most expensive strategy and does nothing to reduce initial cost. (Study Session 13, Module 31.3, LOS 31.h)

6. **A**   Chen Tao can set the terms of the trust to direct the trustee in what she wants to achieve but then leave the trustee discretion in determining how best to respond to changing circumstances. Term insurance that pays when the grandchildren die meets none of the objectives. A deferred start annuity meets some of the objectives by making payouts to the grandchildren over time rather than all at once, and it could even be set up to start payments coincident with the anticipated date of the estate. But costs are high for such annuities, and given the size of the funds, self-insurance (i.e., putting the money in a trust and investing the funds) would be more likely to increase family wealth. (Study Session 12, Module 30.4, LOS 30.g)

FORMULAS

conditional factor risk model:

(Return on $HF_i)_t = \alpha_i + \beta_{i,1}$(Factor 1)$_t + \beta_{i,2}$(Factor 2)$_t + \ldots + \beta_{i,K}$(Factor K)$_t +$
$D_t\beta_{i,1}$(Factor 1)$_t + D_t\beta_{i,2}$(Factor 2)$_t + \ldots + D_t\beta_{i,K}$(Factor K)$_t + $(error)$_{i,t}$

where:

α_i = intercept for hedge fund *i*

$\beta_{i,K}$(Factor K)$_t$ = exposure during *normal* periods to risk factor *K*

D_t = dummy variable that equals zero during normal periods, and one during a financial crisis

$D_t\beta_{i,K}$(Factor K)$_t$ = *incremental* exposure to risk factor K during financial crisis periods

(error)$_{i,t}$ = random error with zero mean

annual accrual taxation: $FVIF_{AT} = [1 + r(1 - t_i)]^n$

deferred capital gains taxation: $FVIF_{AT} = (1 + r)^n(1 - t_{cg}) + t_{cg}B$

B = cost basis / asset value at start of period n

annual wealth taxation: $FVIF_{AT} = [(1 + r)(1 - t_w)]^n$

blended taxation:

weighted annual realized tax rate: $wartr = p_i t_i + p_d t_d + p_{cg} t_{cg}$

return after realized taxes: $r^* = r[1 - (p_i t_i + p_d t_d + p_{cg} t_{cg})] = r(1 - wartr)$

effective capital gains tax rate: $T^* = t_{cg}[p_{deferred\ cg} / (1 - wartr)]$

future value of the investment: $FVIF_{AT} = (1 + r^*)^n(1 - T^*) + T^* - (1 - B)t_{cg}$

future value interest factor for a tax-deferred account (TDA):

$FVIF_{AT} = (1 + r)^n(1 - t_n)$

future value interest factor for a tax-exempt account: $FVIF_{AT} = (1 + r)^n$

$R_{AE} = (FV_{AT} / \text{initial investment})^{1/n} - 1$

$T_{AE} = 1 - (R_{AE} / r)$

after tax return: $r_{AT} = r(1 - t)$

after tax standard deviation: $\sigma_{AT} = \sigma(1 - t)$

relative after-tax value:

$$RV_c = \frac{FV_{\text{tax-free gift}}}{FV_{\text{bequest}}} = \frac{[1 + r_g(1 - t_{ig})]^n}{[1 + r_e(1 - t_{ie})]^n(1 - T_e)}$$

$$RV_{taxable\ gift} = \dfrac{FV_{taxable\ gift}}{FV_{bequest}}$$

$$= \dfrac{\left[(1 - T_g)\right]\left[1 + r_g\left(1 - t_{ig}\right)\right]^n}{\left[1 + r_e\left(1 - t_{ie}\right)\right]^n(1 - T_e)} \text{ if the receiver pays the gift tax}$$

$$RV_{taxable\ gift} = \dfrac{\left(1 - T_g + T_g T_e g\ /\ e\right)\left[1 + r_g\left(1 - t_{ig}\right)\right]^n}{\left[1 + r_e\left(1 - t_{ie}\right)\right]^n(1 - T_e)} \text{ (donor pays gift taxes)}$$

$$RV_{charitable\ donation} = \dfrac{FV_{charitable\ gift}}{FV_{bequest}} = \dfrac{\left(1 + r_g\right)^n + T_{oi}\left[1 + r_e\left(1 - t_{ie}\right)\right]^n(1 - T_e)}{\left[1 + r_e\left(1 - t_{ie}\right)\right]^n(1 - T_e)}$$

generation skipping:

$$FV_{no\ skipping} = PV[(1 + r)^{n1}(1 - t)][(1 + r)^{n2}(1 - t)]$$

$$FV_{skipping} = PV[(1 + r)^N(1 - T_e)]$$

where:

$N = n1 + n2$

SCHWESERNOTES™ 2020 LEVEL III CFA® BOOK 4: ALTERNATIVE INVESTMENTS AND PRIVATE WEALTH MANAGEMENT